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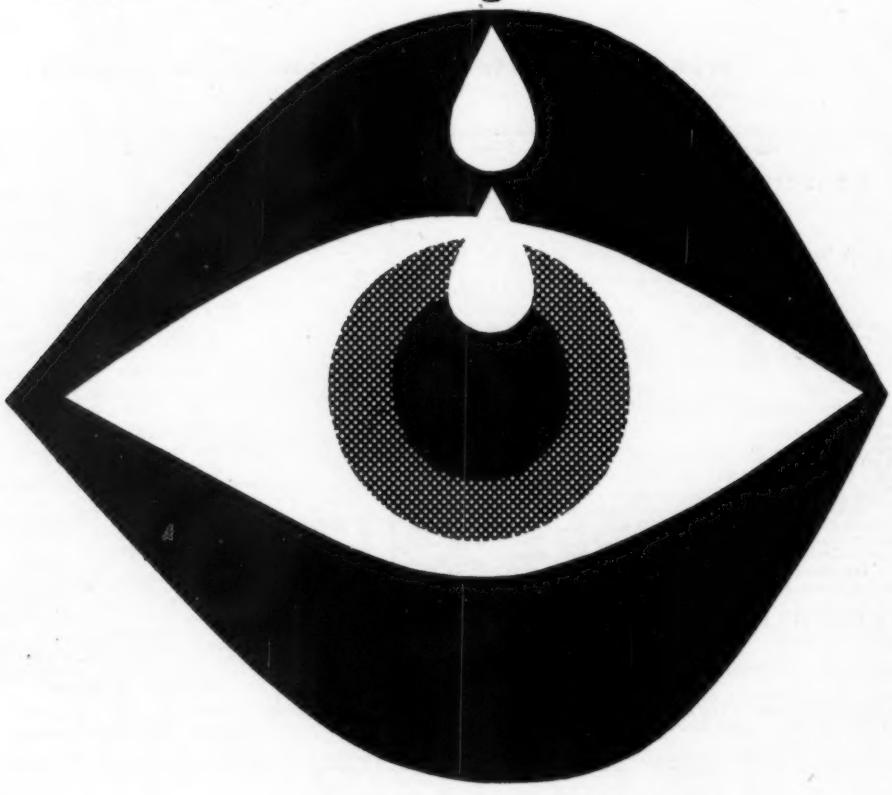

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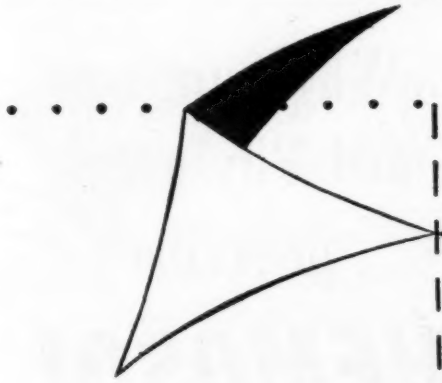

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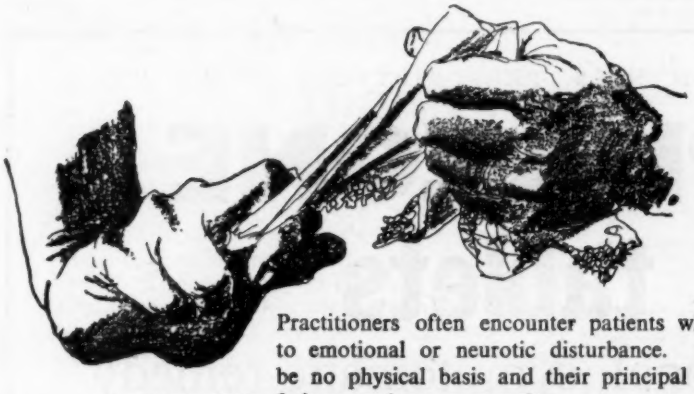

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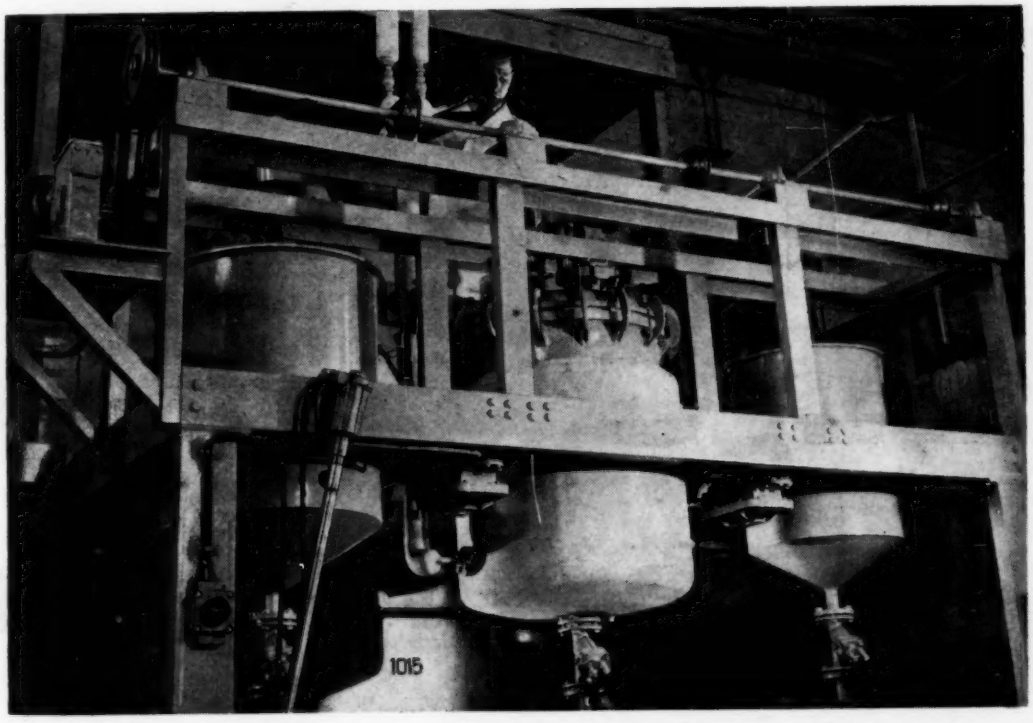

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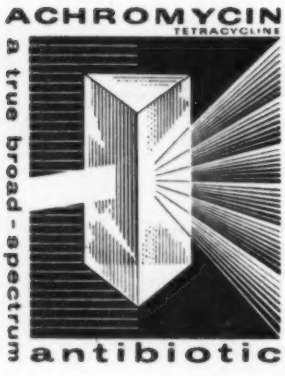

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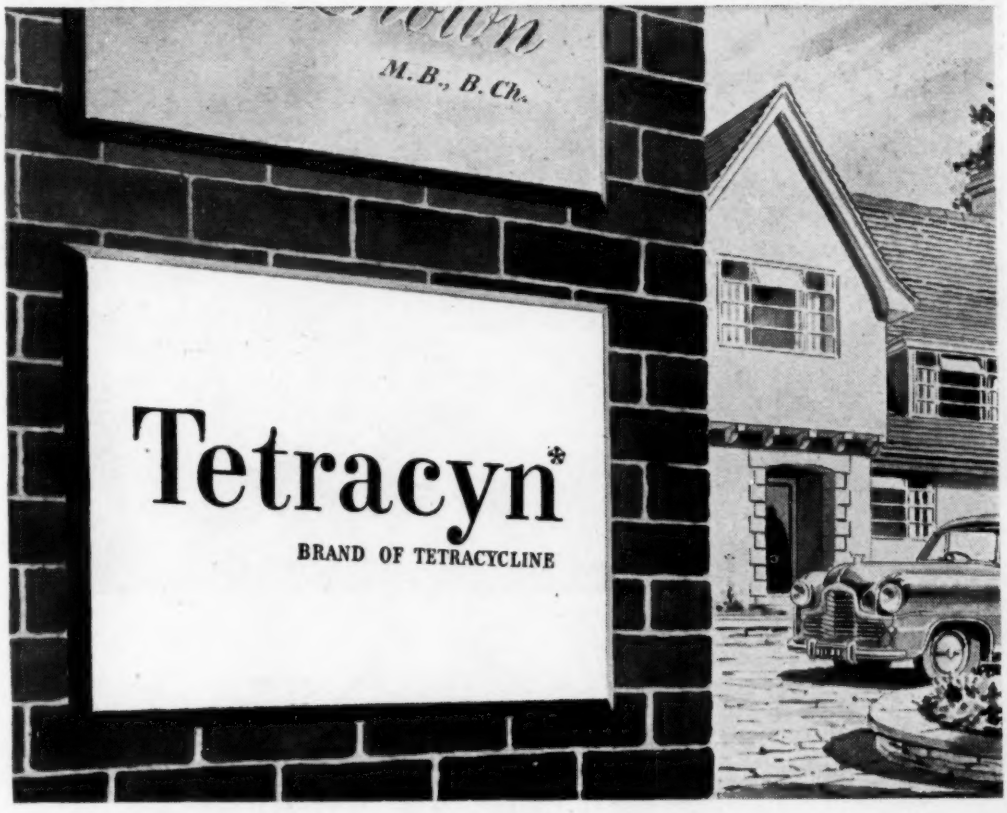

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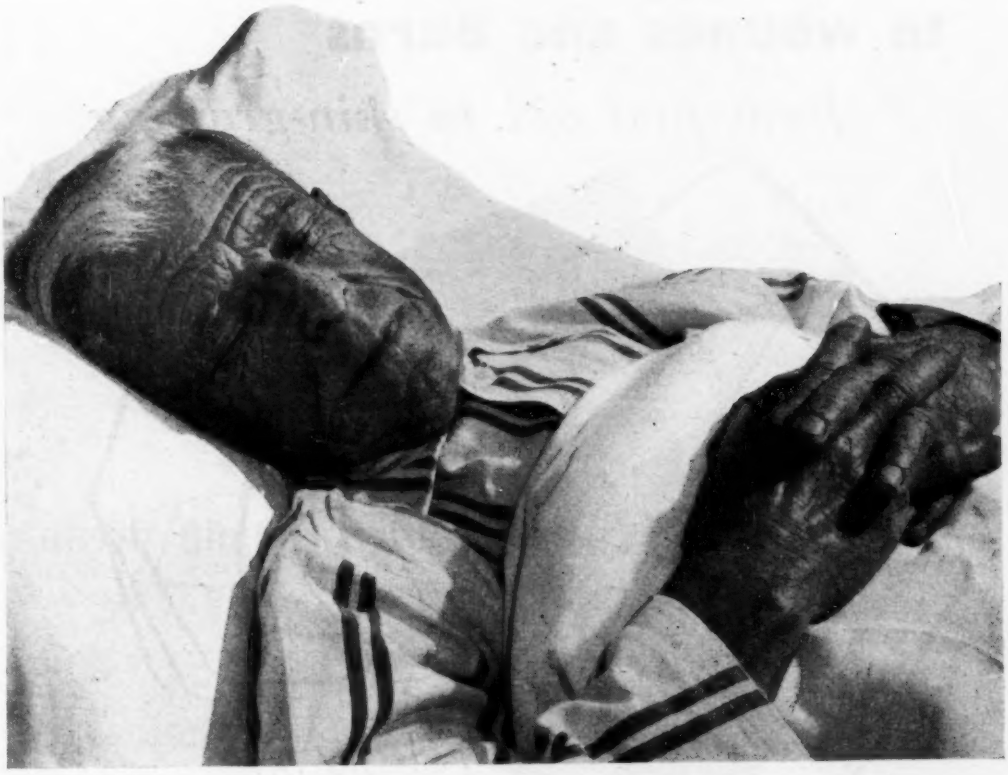

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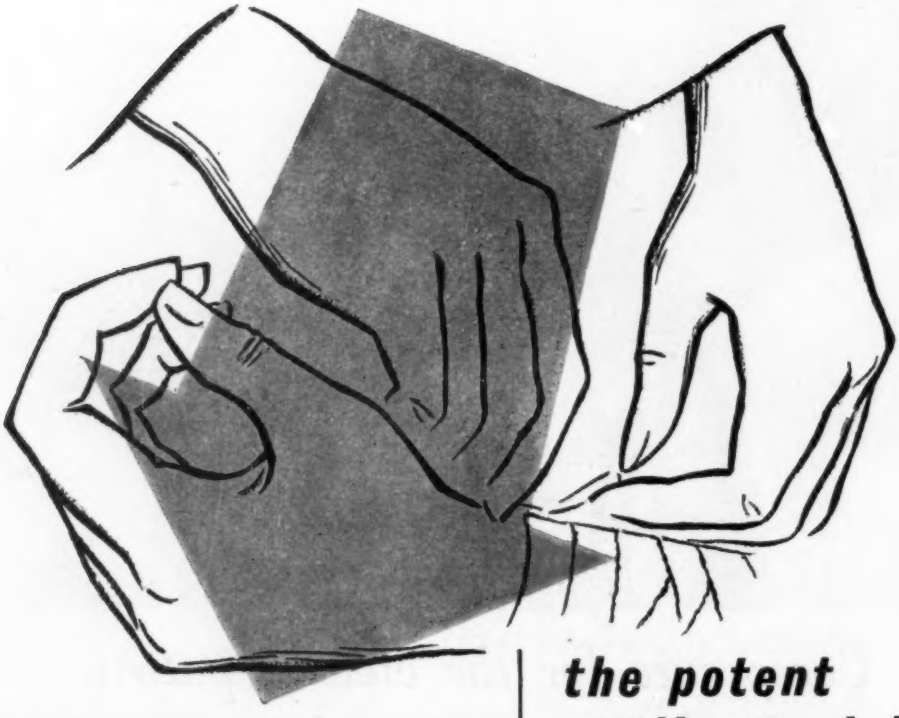

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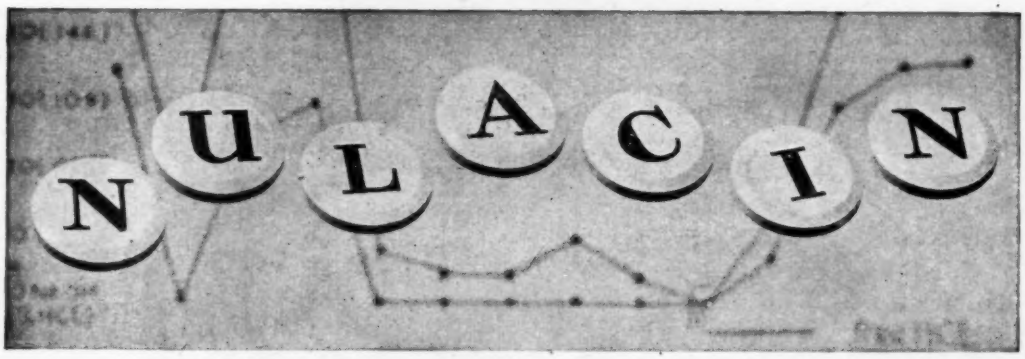

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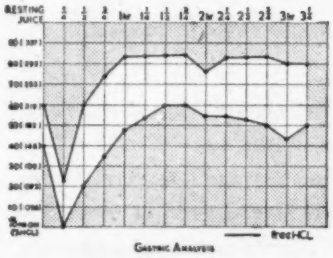
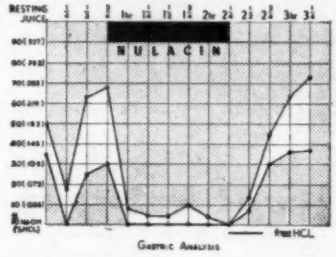
NULACIN tablets are not advertised to the public and have no B.P. equivalent. May be prescribed on E.C.10. The dispensing pack of 25 tablets is free of Purchase Tax. (Price to pharmacists is 2/-.) Also available in tubes of 12.

NULACIN tablets are prepared from whole milk combined with dextrins and maltose, and incorporate Magnesium Trisilicate 3.5 grs.; Magnesium Oxide 2.0 grs.; Calcium Carbonate 2.0 grs.; Magnesium Carbonate 0.5 grs.; Ol. Menth. Pip. q.s.



Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer.



Same patients as in Fig. 1, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.

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Medical Treatment of Peptic Ulcer. *Med. Press*, 27th February 1952, 195-199

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Further Studies on the Reduction of Gastric Acidity. *Brit. Med. J.*, 23rd January 1954, 183-184

Clinical Investigation into the Action of Antacids. *The Practitioner* July, 1954, **173**:46

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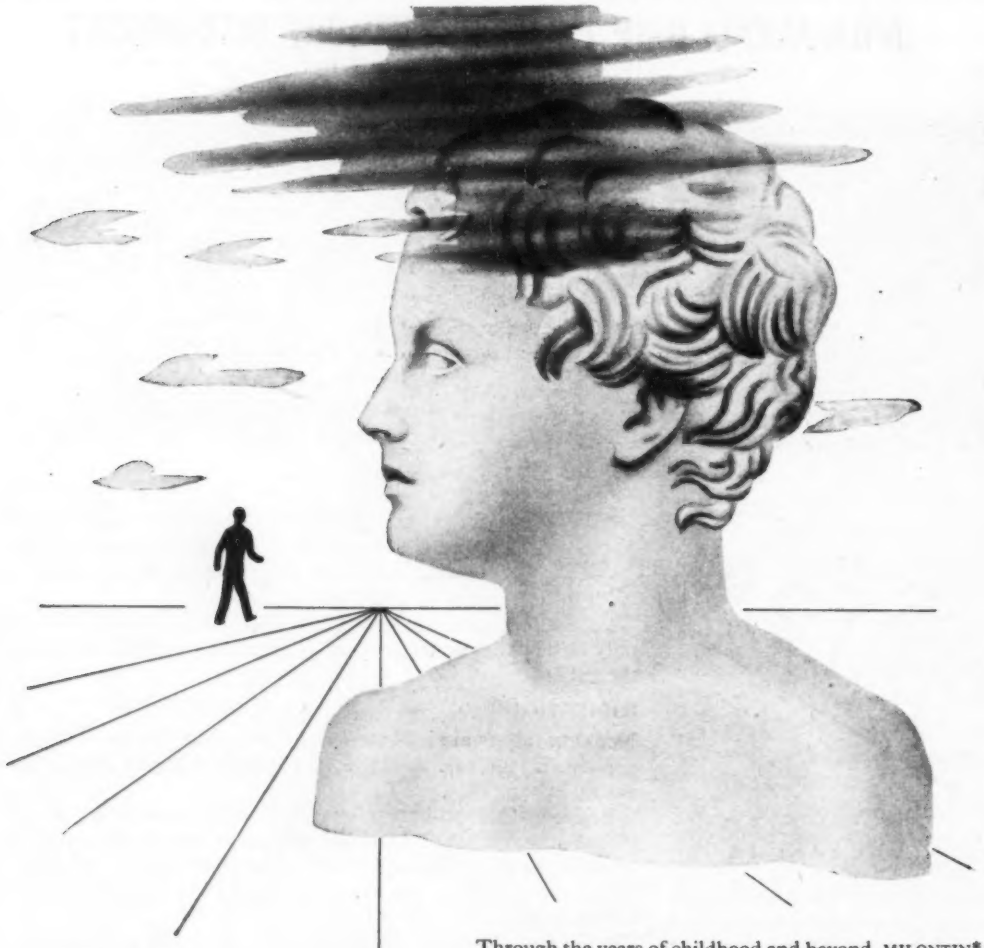

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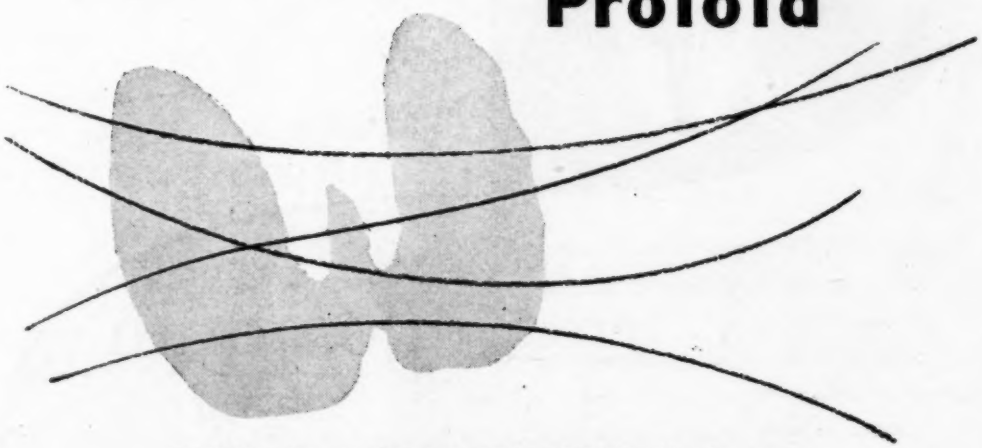

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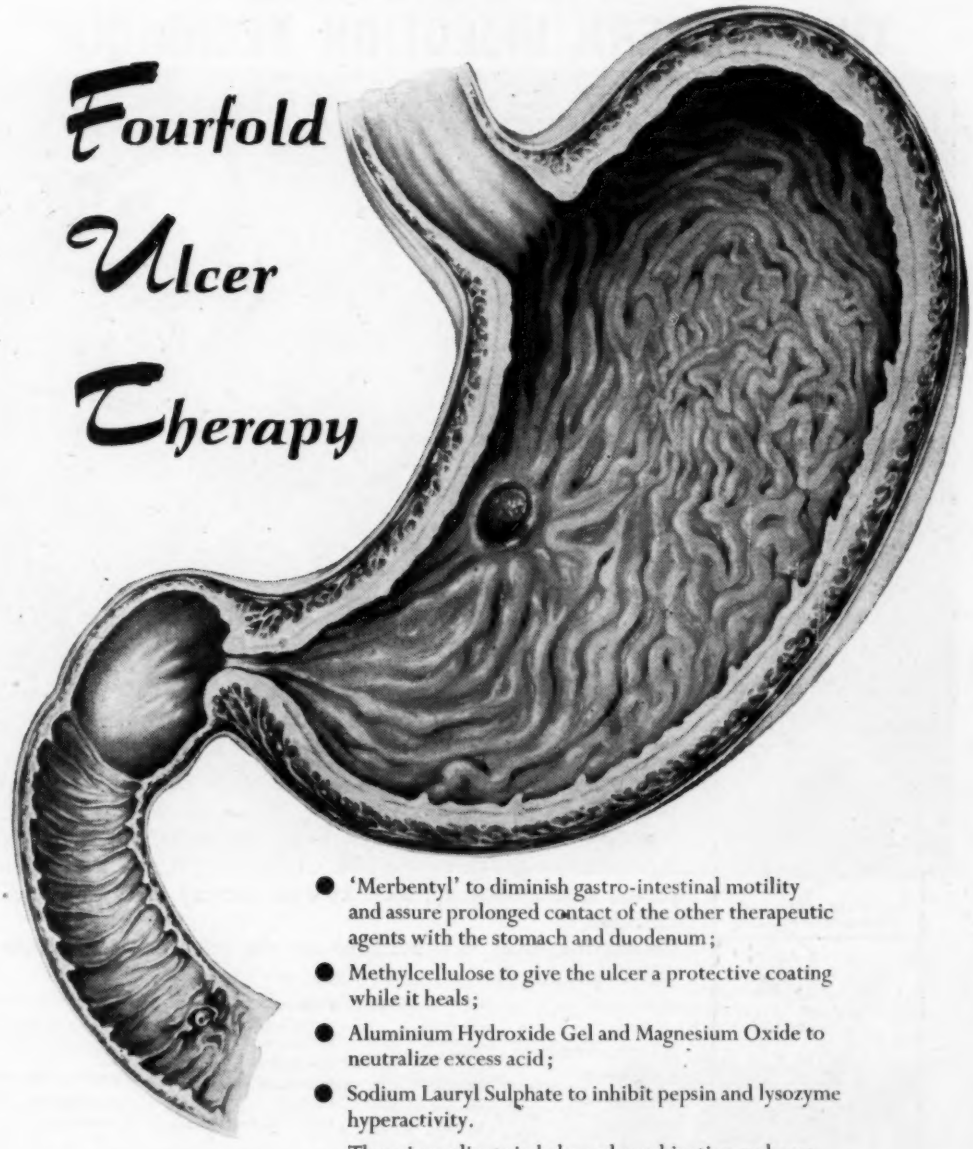

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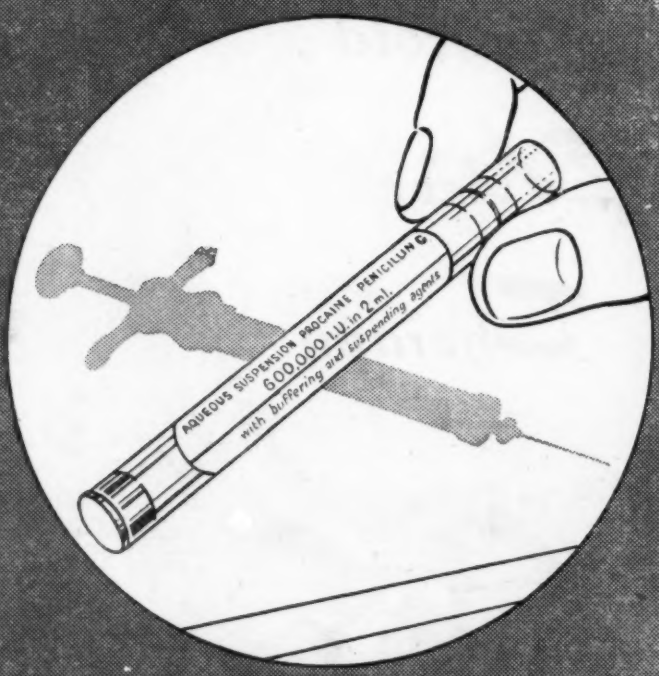

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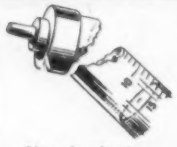

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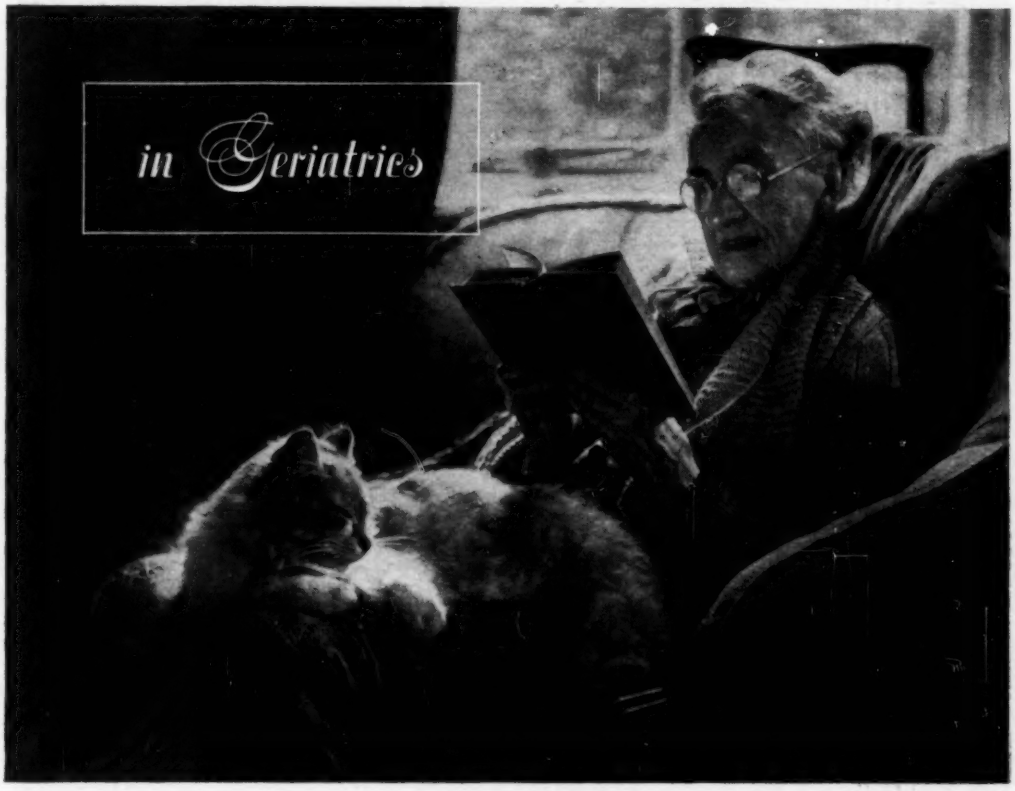

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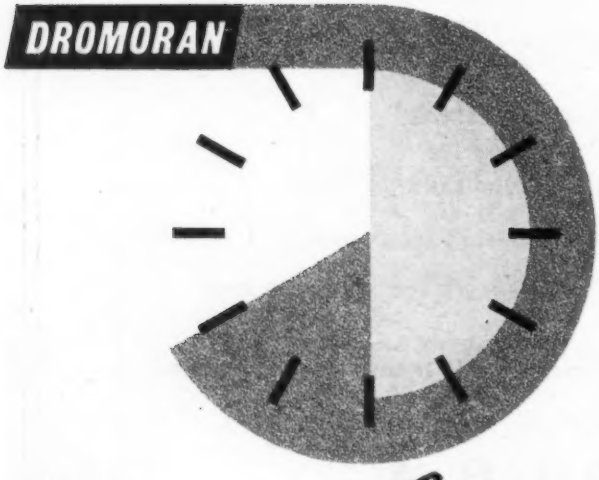

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THE DOCTOR, HIS PATIENT, AND THE ILLNESS *

MICHAEL BALINT
M.D. Budapest, Ph.D. Berlin, M.Sc. Manc., L.R.C.P.E.
PSYCHIATRIST, THE TAVISTOCK CLINIC, LONDON

FOR some years now we have organised research seminars in the Tavistock Clinic to study psychological implications in general medical practice. In one of these seminars the first topic discussed was the drugs usually prescribed by the practitioner. Very soon the discussion revealed—certainly not for the first time in the history of medicine—that by far the most frequently used drug in general practice was *the doctor himself*. It was not only the medicine in the bottle, or the pills in the box, that mattered, but the way the doctor gave them to his patient—in fact the whole atmosphere in which the drug was given and taken.

Unfortunately we soon discovered that as yet this important drug has no pharmacology. No textbook advises the doctor as to the dosage in which he should prescribe himself, in what form, and how frequently. Nor is there any literature on the hazards of this kind of medication, on the allergic responses encountered, or on the undesirable side-effects. The reassuring statement is often made that experience and common sense will help the doctor to acquire the necessary skill in prescribing himself. But this is very different from the very careful and detailed instructions with which every new drug is nowadays introduced into practice.

We decided forthwith that one of the tasks of our research should be to start devising this new pharmacology.

The importance of a study of this kind is perhaps greater nowadays than ever before. Particularly through urbanisation, a great number of people have lost their roots and connections, and the large families with their complex and intimate interrelations are tending to disappear. The individual thus becomes more and more solitary, even lonely. If in trouble, he has hardly anyone to go to for advice, consolation, or even an opportunity to pour out his heart. He is more and more thrown back on himself. We know that in quite a number of people, perhaps in all of us, any mental or emotional stress or strain is either accompanied by, or tantamount to, some bodily sensations. In such troubled states, one of the possible outlets is to drop in on one's doctor and complain. (I have deliberately left the verb without an object because in these initial stages we do not know which is the more important of the two—the act of complaining itself or the particular complaints.) It is here that the doctor's attitude becomes decisive.

As a basis for discussion of the unexpected consequences of the doctor's response to his patient's complaints I shall quote an example recently reported at one of our seminars.

* * *

The patient was a well-dressed and well-spoken, but very unhappy-looking, married woman of 38, complaining of aches and pains between the shoulder-blades. Although she had been on the doctor's list for many years the doctor had seen her only twice before, when she had come complaining about some insect bites. A physical examination revealed nothing except an almost certainly insignificant nodule in her thyroid gland. As the husband was not on the doctor's list, the doctor half casually asked her if she lived with her husband, to which she answered "Yes," and continued that they had no children although they had been married for fourteen years and now they did not bother about it any more. The doctor then asked if she was happy with her husband otherwise, to which she replied, "Unfortunately not"; they had had nothing to do with each other for the past five years, and that "his affections went elsewhere." All this was said quite dispassionately and calmly. The doctor then asked if *her* affections had gone elsewhere too. She became rather hesitant, but finally said "No." Here the doctor stopped, and gave the patient some aspirin preparation—enough for about a week—telling her to come back if she did not feel better. He entered on his card a provisional non-committal diagnosis of ? fibrositis. He thought that by his questions and human approach he had possibly opened the door, and that the patient would come back to him in a few days and would then be able to talk more freely and openly about her real troubles.

A whole host of questions arise here. Perhaps the first should be, was the doctor medically justified in probing into the patient's hitherto private misery? Would it not have been wiser to be less inquisitive? After all, the woman was working, was coping with her misery, although possibly at the cost of considerable mental strain and of some physical pain. Perhaps what she wanted from the doctor was only some relief for her pains. Or if, as a sexually unsatisfied woman, she unconsciously sought some satisfaction from being undressed and touched by a male doctor, would it not have been best to accept this and to stop there?

On the other hand it might be argued that the slight pain in the back was the first sign of her defences cracking—a sign not to be treated lightly. This idea is familiar to every doctor; a slight cough (e.g., in a young pregnant woman) may be just a slight cough, but it may also be the first sign of a tuberculous process. It certainly calls for a proper examination. The same is true in our case; slight and uncertain physical complaints in an unhappy woman may be of considerable importance and must be taken seriously.

* * *

But, if the doctor was justified in asking his questions, was his technique correct? When examining the woman he came to the conclusion that he ought to probe further; and the information he obtained proves that his assumption was well founded. But was he right to probe further *at that moment*? This problem—the problem of when to start—is but little known to the specialist; for when the patient arrives at a hospital or at a Harley Street consulting-room, he has got miles beyond this point. But it is of great importance for the general practitioner, cropping up almost every day.

In every illness there are periods when what the patient needs most is to be left in peace—not to be stirred up, even by sympathetic interest. And there are other periods when any help is desirable even if it means facing fairly severe strain or accepting pain. The general practitioner has to decide what the patient's requirements really are. He has to decide at his own peril and at that of his patient. For his solution of the problem of "when to start" has important consequences for the further development of the illness.

* * *

Let us assume that in our case the doctor's probing was timely—that he started at the right moment. We have now to inquire further whether he ought to have stopped when the patient first showed some signs of emotion. Was he really opening the door, as he hoped; or was he, on the contrary, frightening the patient into further repression? In this case he could count on the strained home situation as his therapeutic ally: if his assessment was right, the home situation must remain unresolved, causing increasing tension in the woman, which would in due course bring her back to the doctor. But, even so, some other approach might have saved

* From the chairman's address to the Medical Section of the British Psychological Society on Jan. 26, 1955.

her unnecessary suffering. We must also ask what will be the effect of the doctor's question about her affections having gone elsewhere? Will she be helped to arrive at a sensible solution of this most important problem of her emotional life, or will she be frightened into a snap decision?

But, having said all this, we must recognise that the doctor had to act in some way or other. The patient was there waiting for help; the waiting-room was there too, filled probably with further patients; and he had to decide on the spur of the moment whether to ask his questions or not to ask them.

As we know, he decided to ask some questions, and to stop at the first sign that he had touched on a tender spot. Had he been a specialist, working either in a hospital outpatient department or in his private rooms, he might never have learnt to what far-reaching consequences his examination led. The general practitioner is in a different position, both more and less enviable. His practice is such that a follow-up is almost automatic: sooner or later he learns the consequences of prescribing himself. Sometimes the information comes in a short notice from the executive council asking him to forward the patient's medical notes to another practitioner. Our doctor may give a sigh of relief, but he cannot escape realising that the drug—himself—did *not* work as intended.

In our case nothing happened for more than six weeks. Then out of the blue the doctor of the factory where the woman works rang up our practitioner. He reported that the woman complained to him of her strained family life and asked for help. The factory doctor suggested bromide medication and asked our practitioner to let her have it on the N.H.S. Our doctor, quite rightly, told his colleague that in the case of this patient there was more than bromide could help; that he was always there if the patient wanted to see him; and that he did not mind at all trying first with bromides. In spite of his accommodating attitude the patient had not turned up yet. The doctor concluded his report to our seminar by admitting that apparently he had made a serious mistake.

We cannot but agree with this conclusion, although it is somewhat hard on the doctor. After all, he did not do anything against the medical textbooks. He examined his patient carefully and conscientiously, as he was taught to do, and his few questions were well within the limits of what is called "medical history taking." What he asked amounted to hardly more than an inquiry whether the patient lived with her husband, had any children, and had a proper adult sexual life. Nowadays questions of this kind are fairly well tolerated both by doctors and by their patients. Consequently it is not the questions themselves that constitute the serious mistake admitted by the doctor. It was the way he put his questions, especially the way he took the patient unawares. Before the woman knew where she was, she was faced with the highly unpleasant fact that she had given herself away, that a stranger—her N.H.S. doctor—had got unnoticed under her defences. The doctor made a mistake in showing to his patient too early that he knew too much: he administered himself in a too heavy dosage. This m[illegible]kly admitted, let us see now what else happe[illegible]ddition to the mistake. The patient, it is true, was frightened away to another doctor; but when arriving there she did not complain any more of aches and pains. Instead she complained of her strained marital life.

* * *

In our seminars we developed a theory to explain this and similar histories. As it may sound rather unorthodox, let me introduce it gradually.

When this patient was examined, the doctor found four possible illnesses—two physical and two psychological. There was the nodule in her thyroid gland, which could have served as a pointer. The doctor, however, dismissed it as irrelevant, probably correctly. There were then the rheumatic pains in the back. The doctor searched carefully for confirmatory physical signs, and, although he found none, he still prescribed some medicine for the pains. That is, he took notice of them, but his whole behaviour was meant to impress the patient not to take them too seriously. Then there was the depression, which the doctor noticed correctly but which he assumed to be a reaction to the unhappy marriage—a kind of secondary symptom. And lastly there was the marriage itself. So at least four illnesses were "proposed by the patient": a slight hypertrophy of the thyroid gland, muscular rheumatism, depression, and chronic sexual frustration causing unhappiness.

A great number of patients, in the initial stages of their becoming ill—i.e., before they settle down to a definite illness—*offer or propose* a variety of illnesses to the doctor. The variety available to any one person is limited by his constitution, upbringing, social position, conscious or unconscious fears, and conceptions of illness. Still, despite these limitations, there are almost always several offers or propositions. Perhaps the most important side-effect of the drug "doctor" is his response to the patient's offer. In this case the doctor did not respond at all to the thyroid hypertrophy, made light of the rheumatism, decided that the depression was symptomatic only, but emphasised the importance of the frustrated and unhappy marital life. The patient rejected him but accepted his response as correct. Was this a desirable development? In other words: has the prospect of therapy become better or worse thereby?

My next question is, what were the factors that determined the doctor's response? Mark you, the doctor's reaction to any offer of an illness is very complex; and when we examined this response we found that much of it depended on what might be called his "apostolic function." By this we meant that every doctor has a set of fairly firm beliefs as to which illnesses are acceptable and which are not; how much pain, suffering, fears, and deprivations a patient should tolerate, and when he has the right to ask for help or relief; how much nuisance the patient is allowed to make of himself, and to whom; &c., &c. These beliefs are hardly ever stated explicitly but are nevertheless very strong. They compel the doctor to do his best to convert all his patients to accept his own standards and to be ill and to get well according to them.

The effect of the apostolic function on the ways the doctor can administer himself to his patients is fundamental. This effect amounts always to a restriction of the doctor's freedom: certain ways and forms simply do not exist for him, or if they do exist, somehow they do not come off well and therefore are habitually avoided. This kind of limitation in the way he can use himself is determined chiefly by the doctor's personality, training, ways of thinking, and so on, and consequently has little to do with the actual demands of the case. So it comes about that in certain aspects it is not the patient's actual needs, requirements, and interests that determine the doctor's response to the illnesses proposed to him, but the doctor's idiosyncrasies. The ultimate development—i.e., whether the patient gets cured or settles down to one of the illnesses proposed by him, and to which—represents a compromise between the patient's propositions and the doctor's responses. Obviously the weight of the contributions of the two partners varies from case to case, and even in the same case may vary in the different phases of the illness. One of the periods when the doctor's contributions are most important is the initial stage of a patient's becoming ill—what I call the "unorganised" period. The woman whose case we are discussing is just in that period, and, as we have learnt

from the case-history, a few questions had unexpected and far-reaching consequences. One may wonder what would have happened if the doctor had accepted the rheumatism and sent his patient for physiotherapy.

* * *

The doctor's contribution—his apostolic function—has many complex sources and many aspects. Most of them are, so to speak, private; they are expressions of the doctor's individuality; and though their importance is obvious, I shall say nothing more about them. Instead I wish to say something about the public aspects of the doctor's apostolic function. By this I mean an almost compulsory way of responding to a patient's propositions—a way imposed upon the doctor by his training.

The case-history we are discussing illustrates how automatic the doctor's responses usually are. The first doctor, although he immediately noticed the pathetic unhappiness of his patient, made a very careful physical examination, to the extent of discovering an almost certainly harmless nodule in the thyroid, noted down on his card the results of his physical examination and his very likely irrelevant diagnosis, and prescribed then some aspirin against an illness which he himself queried. All the time he was fully aware of the depression and unhappiness glaring at him, but all these "psychological symptoms" remained for him beyond the professional pale.

If, instead of having a depressed mien, the patient had been pale, with anæmic lips and mucous membranes, the doctor's response would have been—again quite automatically—absolutely different. Perhaps he would have done a hæmoglobin estimation on the spot and then arranged a blood-count. Certainly he would not have hesitated to ask a host of detailed questions about possible sources of blood-loss, such as menorrhagia, hæmorrhoids, cough, and vomiting. Not only would he be quite confident in asking this kind of question, but his patient would also find them quite natural and would probably not object to a vaginal or rectal examination if her symptoms pointed to the need.

Thus it appears that doctor and patient are joined by a tacit understanding that any examination of the body should be tolerated if the doctor thinks it necessary. The patient is indeed already conditioned as to what kind of reception he (or she) may expect; and what otherwise would constitute a serious violation of modesty is acceptable to, or even demanded by, the general public if it is done for medical purposes. History shows, however, that this attitude is fairly young, possibly fifty to sixty years old, and that it is the result of the apostolic function of a few generations of physicians.

With most doctors and patients the situation is utterly different with regard to any psychological examination. As in the case discussed, the doctor is more hesitant, the patient reacts to the examination more openly with emotions, and in turn the doctor is more easily put off. If the doctor had made the standard request to his patient to strip to the waist, and the patient had shown emotion or reluctance, the doctor would hardly have regarded this as sufficient reason for discontinuing his examination. But the difference between examining the body and examining the mind is quite general; it is the heritage of centuries of medical thinking and of our own training; and, consequently, it is not easily changed. On the other hand change is not at all impossible. During the few years of our research seminars most of the general practitioners taking part have acquired in their areas the reputation of minor psychotherapists. Almost all of them have been approached by patients, not always on their lists, who have explicitly asked them to discuss their psychological problems—which means that they were not only willing to undergo, but demanded, a psychological examination. This is further proof of the efficacy and speedy action of the apostolic function.

* * *

After this diversion, let us return to our case. As you remember, the patient proposed four different illnesses to her doctor. Has she got four different diseases, independent of one another? Or is one the consequence or the symptom of the others? If so, which is the real cause? Further, if it is impracticable to cure the deepest cause, where is the best prospect for any real therapy?

For instance, was she a genuine depressive, whose constant dark mood and repressed ambivalent hostility the husband could not stand, with the result that in time "his affections went elsewhere"? Or was she a fairly average woman who unfortunately married a basically unfaithful husband? If so, her unhappiness might be the expression of her insoluble ambivalent love, which possibly has led to a reactive depression. Again, we could regard her vague pains as a kind of conversion symptom, expressing her inability either to bear in forgiving love all the strains or to free herself aggressively from them. Or do both the slight nodule in the thyroid and the vague muscular pains point to some endocrine disturbance, of which both the depression and the sexual unhappiness are possibly secondary symptoms? We might continue indefinitely this kind of speculation about the possible causes and dynamisms of her state.

We must bear in mind, however, that this speculating is not merely a useless pastime, because it is exactly in this way that the doctor comes to decide what to treat, when, and how. The end-result of this half-conscious half-unconscious reconstruction of the patient's dynamic pathology is the basis of the doctor's response to the patient's propositions.

Conditioned by their training, doctors in general choose first among the proposed illnesses a physical one, because they can understand it better, they have learnt more and so they know more about it, and they can express their findings more easily and more precisely. This almost automatic response might—and quite often does—lead to a great number of unnecessary specialist examinations and to prescribing unnecessary medicines.

An opposite danger, however, is that the doctor may be tempted to brush aside all physical symptoms and make a bee-line for what he thinks is the psychological root of the trouble. This kind of diagnosis or therapeutic method means that the doctor tries to take away the symptom from the patient, and at the same time to force him to face up consciously to the painful problem possibly causing it. In other words, the patient is forced to change his limited symptoms back into the severe mental suffering which he tried to avoid by a flight into a more bearable physical suffering.

This kind of psychological tour-de-force, which is really a violation of a person's private life, is attempted nowadays much more commonly than ever before. Psycho-analysis in particular has given professional people—doctors, psychologists, social workers—methods previously undreamt of. Many of these people have become sensitive to hitherto neglected minute details, and can arrive at conclusions with increasing accuracy. We call this procedure psychological or psychiatric interview technique and we seem to have inherited from our medical ancestors a not very praiseworthy indifference about it. If our diagnostic conclusions are fairly accurate we do not appear to care greatly how much suffering is caused to the patient by our diagnostic methods. Obviously a specialist, or a psychological tester, can indulge more freely in this *belle indifférence des diagnosticiens* than a general practitioner: the patient is not his; the patient was only referred to him for examination; and when the examination is over the patient is referred back. Unfortunately the general practitioner is the last line; the patient is his and he has to see him through. I wonder how many specialists care to find out what the patients say to their family doctors about the specialist's methods and behaviour.

The real risks, however, are even more considerable. Psycho-analysis has taught us not only to observe and interpret minute details correctly, but also to use our skill and knowledge with some assurance, even daring. We psycho-analysts can do so because, first, we have the patient's transference mostly as our ally, and secondly we remain in a most intimate psychological contact with our patient for long periods. Should anything untoward threaten, we are at hand to notice it and to intervene in any emergency. A number of people have acquired considerable diagnostic skill and knowledge by studying psycho-analytic literature assiduously, but they ought to bear in mind that in a short psychiatric or social interview the conditions are quite different; and I think this difference ought to be respected both by non-analysts and analysts.

It is no exaggeration to say that this kind of diagnostic procedure is, in fact, almost as serious an intervention as a surgical operation. Like a surgical operation it should be undertaken at the right time, by the right man, and in the right way. The person who has in the first instance to decide whether there is a good or fair prospect of satisfying these three conditions is the general practitioner: he can ask for help from his colleagues, but the final decision is always his. In the case of a psycho-diagnostic or psychotherapeutic intervention, the situation is still more stringent, because asking for advice psychologically already means the beginning of the intervention. The practitioner is here entirely on his own, and he has to bear the whole responsibility of this vital decision. We are only at the beginning of our research on the diagnostic criteria which will enable the doctor to decide "when to start" with his psychological investigations and therapy, and in which cases.

Obviously this new kind of diagnosis will demand a somewhat different approach to the patient's problems and a somewhat different way of thinking about them. If we are right, it may have far-reaching consequences for general practice—perhaps also for the whole of medical thinking and consequently for medical training.

* * *

As a contrast to the first case, I shall quote a second one in which the question of "when to start" was not raised: patient and doctor drifted along together into a rather difficult situation. In addition this second case illustrates yet another aspect of the doctor's apostolic function. In general it is taken for granted that the doctor ought to do his best to help his patient, to relieve the sufferings—i.e., he ought to be a good and helpful doctor. We all know the extreme case of this urge to help, the *furor therapeuticus*, against the dangers of which every experienced medical teacher should and does warn his students. On the other hand, very little has been written about the compelling need of certain patients to have a "bad," useless, therapeutically impotent doctor. The reason is that there are very few practitioners who can tolerate this rôle, and still fewer who can adapt themselves to it with their eyes open. The overwhelming majority of us, driven by our apostolic zeal, must do everything to impress our patients—and ourselves—that we are helpful, good doctors. These two opposing tendencies—the doctor's need to be helpful and the patient's need to prove that his doctor is no good—usually lead to strain. Our second case-history shows this strain and the somewhat unorthodox means chosen by the doctor to relieve it.

The patient is a man of 58 and has been on the general practitioner's list since May, 1939; but his medical history goes back to 1925—i.e., for exactly thirty years, sixteen of which were with his present doctor. During all this time he has never ceased complaining. He has had pains in his rectum which "made him faint." Numbness in left leg. Bad headaches "only relieved by military march on the wireless." Feels terrible when waiting for trains and buses, becomes giddy when standing about. He knows "he will never get rid of the giddiness until he is in his box." Indigestion is "shocking," and to prove it some of the interviews with his doctor are punctuated by belches. In addition, shortness of breath, "nerves," always blown up, pains in every part of the body, and so on.

Of course he has been seen during the thirty years by innumerable specialists; in fact his notes require a special case. The diagnosis has varied from neurosis, through nervous debility and hypochondriasis, to neurasthenia. Apart from these rather irrelevant and unhelpful tags, the specialists' reports contain only negative findings such as: no carcinoma in rectum, barium meal and cholecystography negative, and chest clear. I have to add that the psychiatrist's report is in exactly the same vein.

Despite all this, the patient has been able to maintain a good enough relation to his wife; and, although they have no children and intercourse occurs but rarely, his wife describes him as a "good husband." Moreover in the past twenty-five years he has only been away from work for two to three weeks, although he has been in a responsible and at times strenuous job as an examiner in a large factory.

The patient must have come to the conclusion, a good many years ago, that doctors can do nothing for him, as no medicine has ever made any difference to his complaints. Still, during all this time he has come almost every Friday evening for a bottle of medicine. Every time he says, "Nobody can do me any good." The doctor has learnt to accept his criticism and still to prescribe a new medicine if it is asked for. On occasions he has even taken down the pharmacopœia, saying, "I have given you everything in this book and nothing has done you any good; will you choose now what you would like." Mark you, this was never said in irritation or annoyance, but in a friendly and, although defeated, still sincerely sympathetic tone. By the way, the patient seems to like these scenes; perhaps he accepts them as a sign of confidence in him!

The doctor summed up the situation to our seminar in this way: "Over the years I have established a relationship with the patient in which I accept that nothing does him any good and commiserate with him; we metaphorically slap each other on the back more or less cheerfully when he attends for his weekly bottle of medicine, which we both agree will not do him any good. He has no resentment towards me, and I am not incompetent because I cannot cure him. In fact I am a good fellow; not like some of those other doctors. He has some pride in his toughness to resist the bad effects of my medicines and tablets and especially in his ability to carry on in spite of the considerable cross he has to bear ('unlike some of the weak-kneed younger men of today'). He is no worry to me. He senses when I want him to go and disappears quickly. If I am busy he comes in and is prepared to leave without much discussion, telling me happily that 'there is a mob in the waiting-room.' He is on my side, in fact."

The doctor could have ended his report equally truthfully: "I am on his side, in fact have been for many years."

Now this is a case which bristles with puzzling problems. Let us see, then, whether our new ideas are of any use here.

It is obvious that the patient has been offering to his doctor illness after illness. Faithful to his training, the doctor himself patiently examined every offer, and then asked the counsel of his more learned brethren, but had to reject every offer as unacceptable. During this "unorganised" period, the patient gradually withdrew into the "you doctors are no good but I can take it because I am tough" attitude. If we accept the year

1925 as the beginning of the " unorganised " period—very likely it started earlier—the patient was then 28. You remember I asked the rhetorical question of what would have happened to the woman patient if her doctor, instead of asking his hesitant questions, had sent her for physiotherapy. Although admittedly our second patient is far more ill than the woman, his case could be considered as a pointer of the direction the woman's illness might have taken. We may here ask the corresponding question of what would have been the fate of this man if, instead of sending him to specialists and prescribing him bottles and bottles of medicine, someone had asked a few pertinent questions at the right moment. Who knows ?

Anyhow, our man settled down and created and grew an impressive illness involving his whole life. Although the superficial symptoms varied and changed, the basic structure of the illness remained the same and became firmer and firmer with the years. One aspect of the illness was to play hell with his practitioner, to rub in time and again that he was no good, absolutely useless. One cannot exclude altogether the possibility that this was partly a revenge for the doctor's rejection of the patient's propositions. Although it is not mentioned in the report, we can well imagine that there were quite a few not very pleasant periods for the doctor. He asked for help from his specialist colleagues, but what he got was only negative advice. That is, he was told what *not* to do, but he got no help whatever on how he could help his patient. I wonder how many of us—whether general practitioners, psychologists, psychiatrists, or social workers—would have remained, under this irritating fire, as calm and imperturbable and as friendly and sympathetic as our doctor. How many of us would have thought of taking down the pharmacopœia and offering it sincerely to the patient to choose from it the medicine he thinks might help him.

It was this atmosphere of unshakable friendly sympathy that enabled the patient to make his peace with his bad and useless doctor and to accept his company for all the troubled years of illness, pain, and suffering. He has obviously been badly in need of company, and without his doctor he would not have been able to keep fit and maintain a tolerable, or perhaps even a not completely unhappy, private life.

To sum up: in this case all the organic illnesses proposed by the patient were rejected one by one, but the doctor accepted the pain and the suffering and honestly tried at least to relieve them. This counter-proposition of his was in turn rejected by the patient, who—perhaps prompted also by his resentment—wanted to have his doctor bad and impotent. The doctor then agreed to this last proposition—i.e., that he cannot relieve the suffering and pain, and agreed also to remain friendly and sympathetic. On these terms a working compromise was established, and patient and doctor settled down to a form of illness acceptable to them both.

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Now imagine that this patient had been on the list of a doctor who—because of his personality—must be a good and helpful man, whose apostolic function compels him to try everything in his power to cure his patients without exception—or mercy. . . .

* * *

I promised to talk about The Doctor, His Patient, and The Illness. But really " the doctor " should have been in the plural, for in any difficult case specialists are called in to advise. This brings in quite a number of new complications. From now on the patient cannot escape feeling that he has got to deal with the whole medical profession, facing him, a single person, in concerted action. This inevitably stirs up reminiscences of his early life, when, as a single child, he had to face the whole world of adults who tried to educate him in their apostolic function. It is in this way that the present situation mobilises all the anxieties, animosities, fears and frustrations, blind confidence and dire suspicions, of that early age. This fact explains why so many patients regress to surprisingly childish methods in their relation to their doctor or doctors—e.g., to complete subordination, or swearing blindly by the doctor's words; to an almost crazy rebelliousness, ridiculing and belittling anything and everything that the doctor proposes; or to a habit of playing off one doctor against the other. But behind their unrealistic attitude is always the gnawing fear and the abject dependence. They feel that possibly something very important has gone wrong in their body or mind; that they cannot put it right by themselves; but that almost certainly this can be done by outside expert help. With this help they may survive: without it they are doomed.

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We know that during the initial " unorganised " period of their illnesses, patients gradually withdraw from their environment and first create and then grow the illness on their own, out of themselves. This period is only poorly understood: our psycho-analytic methods do not enable us to follow in detail the patient in his struggle with the growing illness. In this situation there is as yet no second powerful person present, and certainly no external partner on whom emotions could be transferred and thereby made accessible to our analytic methods. But the situation changes fundamentally when the patient reaches the stage of complaining. Although his illness is usually still unorganised, he now needs, and usually also finds, a partner, a superior one, from whom help can be expected on whom emotions can be transferred. Here we analysts are more at home and can use our methods with more confidence, and our ideas may be of some use to the general practitioner in his arduous task.

It is equally true, however, that we can also learn from the experiences of the general practitioners; for it is only seldom that we see patients in the unorganised state in which the practitioner first encounters them, and we have mostly avoided getting involved with them at this stage. On the other hand the psycho-analytic process is tantamount to stirring up rigid, settled-in attitudes and forms of reaction, and almost every day we witness and have to work with both kinds of transition —from organised to unorganised and from unorganised to organised states. Expressed in our new terms we find again the patient proposing something to his analyst and the analyst responding to it according to his own apostolic function. Compared with the general practitioner, we analysts are in a better position because we possess a considerable literature which advises us in some detail which parts and aspects of the material produced by our patient should be interpreted, when and how. Despite this important difference, the apostolic function operates automatically—exactly as in the case of the general practitioner. The illness as it develops and changes in the two-person analytic situation is always the result of a compromise, of an interaction, between the analyst and his patient.

To show what I mean by this interaction I wish to quote a historical example:

In Freud's early writings the illnesses most frequently mentioned were hysteria, phobia, and the group he called actual neuroses, foremost amongst them neurasthenia. It was he who detached from that group the obsessions, and in the next period these seem to have dominated the field. In still later years actual neuroses practically disappeared from the literature and almost every case was described either as character neurosis or neurotic character disorder. Nowadays we have learnt to recognise the importance of depressive, paranoid, and other psychotic mechanisms in nearly all our cases.

Does this mean that the patient material itself has changed ? In my opinion it means rather that our knowledge of the human mind has changed, has deepened

and widened, and that consequently our responses to the patient's propositions and offers are different now from what they were fifty, thirty, or even twenty years ago. A consequence, and a very important one, of this change in our responses, in our apostolic function, is that by them we determine, so to speak, the main spheres of the mind, where the most important parts of the analytic work have to be done. This may explain why analyses today are so different from what they used to be.

I have discussed the need for the general practitioner to respond to his patient's propositions in such a way that the ensuing compromise should focus attention and interest on the proposition which offers the best prospect of therapeutic help. But there is equal need for us psycho-analysts to ask ourselves whether our present responses to our patient's propositions—i.e., our present ways of interpreting the material produced by the patient—lead to a compromise which focuses attention, interest, and libido on the proposition which offers the best prospect of therapeutic help.

I know that these ideas throw a heavy and alarming responsibility on all of us—general practitioners, specialists, psycho-analysts alike—but I cannot see how any one of us can avoid shouldering it. And I firmly believe that, by becoming more and more aware of our rôles in the patient-doctor relationship—i.e., of our side-effects as drugs—our therapeutic efficiency will grow apace.

POSTSCRIPT

Throughout this address I have used the word "illness" in the same sense as it is used in general medicine. For example, in the first case discussed, the four conditions were described as illnesses in their own right, although obviously they may influence one another or one may be secondary to the other.

If I am right, psycho-analysis is about to develop a new conception, which may be called "basic illness" or perhaps "basic fault" in the biological structure of the individual, involving in varying degrees both his mind and his body. The origin of this basic fault may be traced back to a discrepancy in the early formative years (or possibly months) of the individual between his own needs and the care and nursing available at the relevant times. This creates a state of deficiency whose consequences are only partly reversible. Although the individual may achieve a good, or even very good, adjustment, the vestiges of his early experiences remain and contribute to what is called his constitution, his individuality, or his character make-up both in the psychological and the biological sense. The cause of this early discrepancy may be congenital—i.e., the infant's needs may be too exacting—or may be environmental, such as insufficient, careless, haphazard, over-anxious, over-protecting, or only un-understanding care.

Should this theoretical approach prove correct, then all the pathological states of later years, the "clinical illnesses," must be considered as symptoms or exacerbations of the "basic illness," brought about by the various crises in the development, external and internal, psychological or biological, of the individual. I wish to explain that my address was concerned only with the "clinical illnesses" of later years and not at all with the "basic illness."

"... how far can the general practitioner be rigidly scientific ... and if he could and did, would he not become the 'medical technician' of whom some doctors disapprove? Who would then deal with the patients' disabilities, inabilities, disorders, as distinct from narrowly defined 'diseases'? And would the patient, *qua* patient, be allowed to be neurotic, or ever normally worried or subject to conflicts? Would the average doctor be happy if his 'non-scientific' problems were handed over entirely to almoners, social workers, psychiatric social workers, marriage guidance counsellors, family welfare advisers, poor man's lawyers and specially selected priests? Most of these perform their functions excellently when properly chosen and trained, but would the increase in their responsibilities and numbers decrease those of the doctors, as we understand the term?"—T. H. PEAR, *Social Differences in English Life*. London, 1955; p. 39.

BILATERAL LUMBAR PLEXUS LESIONS
SIMULATING CAUDA-EQUINA COMPRESSION

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INFLAMMATORY disease of vertebral bodies, commonly tuberculous, often proceeds to collapse and compression of the posteriorly lying neural structures in the spinal canal. Paraparesis or paraplegia results. Less often disease extending laterally into one or both psoas muscle compartments causes paraplegia or paraparesis by involving the outflowing nerves of the lumbar plexus. Four such cases are considered here, and attention is drawn to the features differentiating bilateral plexus lesions from the more common cord or cauda-equina compressions.

Study of the literature indicates that even unilateral lumbar plexus lesions are uncommon in association with psoas abscess.

Case-reports

Case 1.—A boiler fireman, aged 56, was admitted to hospital on April 11, 1946, complaining of a dull ache in the left sacro-iliac region for one year. The pain was aggravated by bending forward and relieved by rest. Latterly it had radiated down the posterolateral aspect of the left thigh and calf to the lateral malleolus and had been accompanied by stiffness in the lower back.

Examination showed evidence of hypertension and arteriosclerosis. The spine had a slight tilt to the right with marked restriction of mobility. There was tenderness on pressure over the spines of the third, fourth, and fifth lumbar vertebræ with reference of pain to the left buttock. Motor power was deficient in the left glutei, hamstrings, posterior calf muscles, and peronei. On the right side there was weakness of the dorsi and plantar flexors of the ankle and of the peronei. The left knee-jerk was greatly depressed and the ankle-jerk less so. The right tendon-jerks were normal. There was no sensory loss in either leg. Straight-leg raising was limited on the left side to 60° with reference of pain to the left hip.

Investigations.—Lumbar puncture produced clear yellow fluid under a pressure of 150 mm. There had been two unsuccessful punctures elsewhere, and the yellowness was thought to be explained by previous trauma. Queckenstedt's test was negative. There was no increase in white cells, and the total protein was 80 mg. per 100 ml. The Wassermann reaction was negative for both blood and cerebrospinal fluid (C.S.F.). Radiography showed partial collapse of the body of the fourth lumbar vertebra with considerable narrowing of the disc-space between the third and fourth lumbar bodies. No paraspinal abscess shadow was seen. Pronounced osteo-arthritic changes suggested that the condition was of long standing. The provisional diagnosis was "compression of the fourth lumbar body with a lesion of the lumbar third-fourth intervertebral disc causing bilateral root compression."

Progress.—Arrangements were made for spinal decompression of the affected roots, biopsy, and subsequent spinal fusion. The patient was later admitted to hospital for this purpose, but by then his symptoms had subsided to such an extent that he wished to return to work. There was less weakness of the leg muscles. Spinal movements had improved. Tendon-reflexes were still depressed in the left leg. The C.S.F. pressure was now 100 mm., with normal dynamics. The fluid contained 18 white cells per c.mm. Protein was 70 mg. per 100 ml.

Age, hypertension, and symptomatic improvement taken together decided in favour of conservative treatment. He returned home and resumed work. Five months later, having been well in the interval, he was admitted to a medical ward with hæmatemesis and melæna, and complaining of severe frontal headache and cough. Signs of meningitis developed

soon afterwards. Intracranial pressure increased progressively as did the cells in his C.S.F. He lapsed quickly into coma and died ten days after admission.

Necropsy showed, in addition to the tuberculous meningitis which caused death, a spinal lesion from which it took its origin. The fourth and fifth lumbar vertebræ were extensively eroded and replaced—mostly anteriorly—by soft caseous material. From this lesion pus extended laterally into the substance of the psoas muscles on either side. The lumbar nerves were not examined microscopically. There was no extradural extension of the disease. The spinal cord and roots showed congestion of the pia mater but no surrounding exudate.

Case 2.—A ploughman, aged 28, a diabetic under treatment, had a Brodie's abscess of the left femur drained on July 17, 1945. Four months later it had healed. On Nov. 20, 1945, he complained of low backache and pain radiating into the sacrum. Next day it spread to both groins. The front of the left thigh felt numb. Two weeks later he was admitted to a surgical ward with increased pain and a swinging temperature. Large doses of penicillin did not control the infection. Four days later he had difficulty in initiating micturition, and developed severe abdominal distension. He complained of weakness of the thigh muscles and numbness of the front of both thighs.

Examination and Investigations.—He preferred to lie on his back with both hips flexed. Distension was too great to permit of successful abdominal palpation. There was no spinal deformity and only slight tenderness on pressure or percussion over the mid-lumbar spine. In the lower limbs there was wasting and bilateral flaccidity of the quadriceps muscles, with lesser wasting of the adductors of the thigh The anterior tibial group were still less weakened. Other muscle-groups showed normal power. The knee-jerks were both absent and the ankle-jerks preserved. Plantar responses were flexor. There was bilateral depression to all modalities of stimuli over an area in the legs corresponding to the first, second, and third lumbar dermatomes on the right and to the first, second, third, and fourth lumbar dermatomes on the left. Above and below this level sensation was normal. Joint-position sense was unimpaired. Skiagrams of the lumbar and thoracic spines were normal. The white-cell count was 20,000 per c.mm.—mostly polymorphs. Blood-culture was sterile. Extradural spinal abscess was diagnosed.

Management and Progress.—The extradural space was explored by excision of the ligamentum flavum bilaterally, between the eleventh thoracic and first lumbar levels. Conditions there were found to be normal, with fat of the usual consistency and a normally pulsating dura. A fine rubber catheter passed freely upwards and downwards for 5 cm. in the epidural space. Exploration was also carried out between the third and fourth lumbar levels with negative results. Lumbar puncture at the close of the operation showed that there was free conduction of fluid throughout the spinal theca. There was no increase of cells in the fluid, and the protein content was 20 mg. per 100 ml. Attention was then focused on the affected nerves in their extraspinal course. Exploratory puncture revealed chocolate-coloured pus anterior to the lumbodorsal fascia in both loins. *Staphylococcus aureus*, insensitive to penicillin, was cultured. Paralytic ileus developed and the patient died two days later.

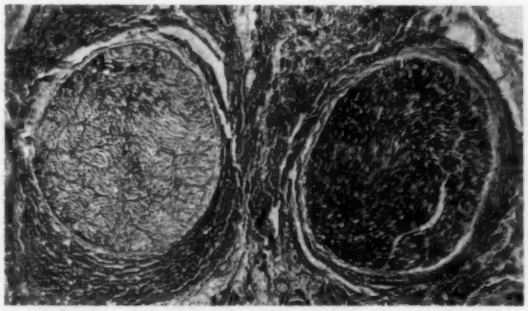

Fig. 1—Section of the nerve trunks in case 2, showing inflammatory changes in the perineurium and patchy demyelination in one bundle. (Anderson's stain, × 40.)

At necropsy, in addition to the old abscess in the femur, an area of eroded infected bone was found on the medial surface of the left ilium. It formed a small part of the wall of massive abscess cavities in the substance of both psoas muscles; the cavities communicated across the lower lumbar vertebræ and extended from the suprarenal glands to the pelvic brim. The fifth lumbar body was destroyed anteriorly to a depth of 5 mm., and the fourth was affected to a lesser extent. The abscesses contained pale chocolate-like fluid. The sheaths of the lumbar nerves lying in the abscess cavities were swollen and congested. The autonomic nerves also lay in the abscess wall. The spinal cord showed no abnormality. Sections of the nerve trunks showed the epineurium to be involved in a subacute inflammatory process (fig. 1). There was patchy demyelination and œdema around the fibres. The histological diagnosis was "pyogenic interstitial neuritis."

Fig. 2—Radiograph of the lumbar spine in case 3, showing the lesion in the bodies of the third and fourth lumbar vertebræ and calcification in a right-sided psoas abscess.

Case 3.—A housewife, aged 26, suffered from bilateral pulmonary tuberculosis which was diagnosed in March, 1946. In November, 1946, while under sanatorium treatment, she began to complain of pain in the lower lumbar region radiating to the front of the right thigh.

Examination and Investigations.—A psoas abscess was palpable in the right iliac fossa. There was spasm of the lumbar muscles and a lumbar kyphosis but no abnormal neurological signs in the lower limbs. Radiography showed erosion of the contiguous bony borders of the third and fourth lumbar bodies and narrowing of the intervertebral space (fig. 2). The outline of the right psoas shadow was ragged; the left was normal. Lumbar puncture produced clear C.S.F. under normal pressure. Queckenstedt's test was negative. There were 2 cells per c.mm., and 50 mg. of protein per 100 ml. This was taken to exclude intraspinal disease, or at least to rule out the possibility of cord or cauda compression.

Treatment and Progress.—The patient was immobilised and the abscess emptied by aspiration on three occasions. Amounts of pus up to 150 ml. were withdrawn, in which tubercle bacilli were seen. By June, 1947, there was less spasm of the lumbar muscles and lumbar tenderness was not so severe, but considerable weakness of the right quadriceps muscles had developed and both knee-jerks were absent. There was no apparent motor weakness on the left side and no sensory loss in either leg. An attempt to aspirate the abscess at this time was unproductive. A month later the patient complained of weakness of the left leg. Examination then revealed loss of power in both quadriceps muscles, and some weakness in the hamstrings and the dorsiflexors of the ankles and toes. The weakness was greater on the right side. There was sensory loss to all modes of stimulus over the third, fourth, and fifth lumbar dermatomes on both legs. The sacral segments were normal. Knee-jerks were absent and ankle-jerks present. The right psoas abscess was emptied again but an attempt to aspirate pus from the left psoas compartment failed. Radiography showed little alteration in the vertebral disease but now there was evidence of disease in the left psoas muscle as well as in the right, though no mass could be palpated on the left side.

Further Progress.—After aspiration of the right psoas abscess there was improvement in both legs. Power recovered

in the right quadriceps first, and thereafter the right knee-jerk returned. A month later the left knee-jerk had returned and no sensory abnormalities were demonstrable on either side. More pus was aspirated from the right side on two occasions. Further left-sided aspirations yielded no pus, but a mass became palpable in the left flank. Over the next six months progressively smaller amounts were removed from the right abscess and some calcification of its outline appeared in skiagrams. Eventually there was no demonstrable neurological abnormality in the legs and this state of affairs has been maintained.

Case 4.—A colliery washerman, aged 40, had suffered from tuberculous disease of the spine since childhood. When first seen as an outpatient on Nov. 5, 1947, he complained of weakness of the ankles for one year and had adopted a high-stepping gait to overcome this. For two months he had experienced pain radiating down the posterolateral aspect of both buttocks, thighs, and calves, and extending across the dorsum of the feet into the big toes. Weakness spread to involve the knees and his gait became quite unsteady. He was known to have had a right psoas abscess at the age of 8.

On examination, there was a gross kyphosis with its apex at the lower thoracic level. No abdominal mass was palpable. The left leg showed weakness of the external rotators of the hip and the hamstrings, with complete paralysis of the dorsiflexors and evertors of the ankle and weakness of the invertors. On the right side there was a lesser weakness of the abductors and external rotators of the hip, of the hamstrings, and of all the muscles moving the ankle except the plantar flexors. The knee-jerks were depressed. The ankle-jerks were brisk and equal and the plantar responses flexor. The abdominal reflexes were symmetrical but sluggish. There was sensory depression to all types of stimuli in the fifth lumbar and first sacral dermatomes bilaterally. The sensory loss was thus much less extensive than the motor.

Investigations.—Radiography showed lumbodorsal kyphosis with an angulation less than 90°: The twelfth thoracic and first and second lumbar bodies were disintegrated and the upper half of the third lumbar body eroded—apparently recently. The calcified lower end of a psoas abscess was seen on the right side.

Progress.—It was suggested that the referring surgeon should carry out a lumbar puncture to make sure that there was no spinal-fluid obstruction and then empty the supposed psoas abscess by aspiration or operation. Before this could be done the disease process extended. Difficulty in micturition developed and with it anæsthesia in all sacral segments. He was admitted to the neurosurgical unit with a complete paraplegia.

Operation.—Immediate decompression was carried out through an anterolateral approach. Sequestrated disc and necrotic bone was removed from in front of the dura and an abscess evacuated from the right paraspinal region.

Further Progress.—After operation he required continuous bladder irrigation for fourteen days, after which he passed urine normally. Sensation in the sacral segments returned but depression persisted in the fifth lumbar and first sacral dermatomes bilaterally. For some time there was spasticity in both legs but this disappeared in two months and the plantar responses became flexor again.

Follow-up examination nine months later revealed some weakness of the dorsiflexors and evertors of the right ankle and of the dorsiflexors of the toes. There had been some return of power to the dorsiflexors of the left ankle but ankle evertors and the dorsiflexors of the toes remained paralysed. The right knee-jerk was weakly present, the left absent. Both ankle-jerks were brisk and equal. Plantar responses were flexor. Bowel and bladder function was normal. The weight was increasing and the erythrocyte-sedimentation rate was normal. All signs of cord compression had apparently disappeared, and there was a return to the initial state showing bilateral involvement of the nerves of the lumbar plexus.

This case is included with less confidence because the absence of C.S.F. obstruction was not demonstrated initially. Further, involvement of the lower plexus roots is unusual, and the lesion could possibly have been caused by epidural granulation tissue surrounding the lower lumbar roots intraspinally.

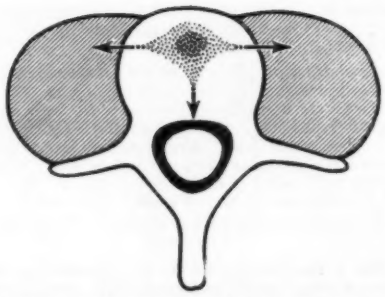

Fig. 3—Diagram showing the relationship of a vertebral disease-focus to the spinal canal behind and to the psoas compartments on either side.

Discussion

MECHANISM OF NEURAL INVOLVEMENT

Vertebral disease may spread in two directions to involve nerves—laterally into the substance of the psoas muscle or posteriorly to compress the spinal cord or cauda equina (fig. 3). In assessing the probabilities reflected in bilateral neurological deficits in the lower limbs it must be remembered that a tuberculous focus in a body may spread into both adjacent psoas muscles without at the same time passing backwards. This happened in the first three cases, but in the fourth bilateral spread occurred first and later was followed by posterior compression.

DIFFERENTIAL DIAGNOSIS

Diagnosis should not be difficult on clinical grounds, provided the possibility of bilateral plexus lesions is remembered. In cauda-equina compression there will probably be bilateral symmetry and some involvement of the sacral roots. Bladder dysfunction is almost invariable. In plexus lesions neural involvement is usually asymmetrical and the sacral roots escape. Bladder function is normal. Case 2 complained of difficulty in starting micturition, but this was probably caused by involvement of the sympathetic nerves on the posterior pelvic wall. Radiography may show the presence of psoas abscesses. Lumbar puncture with Queckenstedt's test shows free C.S.F. conduction if the lesion is extraspinal. It should not be necessary to resort to myelography.

Intrinsic spinal-cord lesions should not be difficult to differentiate. A glioma or angioma at the level of the second to fourth lumbar segments can cause lower motor neurone lesions like those of lumbar plexitis, and may even cause spinothalamic sensory defects with sparing of the sacral dermatomes, but there will also be present signs of pyramidal tract interruption causing increase of the ankle-jerks and extensor plantar responses.

Though all our cases had chronic infective lesions it is possible to imagine neoplastic conditions causing bilateral plexus involvement without intraspinal extension.

We have had under observation for four years a patient with a myeloma of the tenth thoracic vertebra which had collapsed. She had a mixture of signs of spinal-cord compression and lumbar-plexus involvement. When the spinal cord had been decompressed and the whole diseased area treated by radiotherapy, the sensory level of analgesia disappeared and bladder control was restored. There remained lower-motor-neurone lesions causing flaccid paralysis below the knees, which were almost certainly caused by infiltration or compression of the lumbar plexus in its extraspinal course.

NATURE OF THE PLEXUS LESION

In the only one of the four cases in which histological material was available the nerve lesion was described as

a pyogenic interstitial neuritis. The epineurium was involved in a subacute inflammatory process and the fibre-bundles showed œdema and patchy demyelination. This may be the common lesion.

Tallroth (1939) records a case of iliopsoas hæmorrhage in a hæmophiliac which was followed ten days later by signs of a femoral nerve lesion. He found no previous record of a similar case associated with hæmophilia. He points out that of the nerves in the psoas compartment, the genito-femoral, obturator, and lateral cutaneous nerves are thinner and run more transversely, and over shorter distances, than does the femoral, which lies within the sheath all the way from its origin to the pelvic brim. The femoral nerve is therefore more vulnerable than the others. He suggests that the nerve lesion was caused by rapidly increasing pressure associated with an oozing hæmorrhage. In support of the pressure hypothesis he says that gravitational abscesses from tuberculous spondylitis do not cause femoral nerve lesions because the pressure rises slowly.

Michelson (1945) describes a case of trauma to the psoas muscle with hæmorrhage within the sheath and temporary impairment of sensation in the territory of the ilio-inguinal nerve. Considering the cause of the nerve lesion he says:

> "Sudden increase of pressure within the psoas sheath due to hæmorrhage and/or infection may irritate the enveloped nerves sufficiently to produce symptoms of neuritis. Nerves are not involved with chronic, slowly progressive lesions such as arthritis of the spine due to tuberculosis."

In Vuori's (1947) review of the condition of primary suppurative myositis in the psoas muscle there are no cases of neural involvement.

Schroeder (1938) describes five cases of primary psoitis, none of which showed evidence of neuritis. This condition of primary psoas abscess, usually staphylococcal in origin, is the one in which neuritis would be expected whether the cause is increased pressure or inflammation.

Increased pressure within the psoas compartment bounded by an unyielding fibrous sheath appears to be a factor common to all the cases described. The four reported here make it clear that the increase of pressure does not require to be rapid as Tallroth (1939) and Michelson (1945) suggest. The histological finding of inflammatory changes in the lumbar plexus in case 2 does not necessarily mean that they had a causal significance in the production of neurological dysfunction. The absence of neurological signs in reported cases of acute suppuration in the psoas muscle indicates that toxic inflammatory changes in the nerve sheaths are unlikely by themselves to interfere with neural conduction.

We suggest that compression of the vasa nervorum of the lumbar plexus is the primary reason for the nerve changes. This should be relieved by closed or open drainage of the psoas compartment.

Summary

Bilateral neurological abnormalities in the distribution of the lumbar nerves may be caused by two paraspinal lesions as well as by one intraspinal lesion, though the two will probably arise from one vertebral focus.

Four such cases are reported and the differential diagnosis and treatment discussed.

The cause of the plexus lesion is probably simple increase of pressure within the psoas compartment, and treatment should be directed towards lowering this pressure.

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HEIGHT, WEIGHT, AND SKELETAL MATURITY IN THE FIRST FIVE YEARS OF LIFE

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SEVERAL communications from the Oxford Child Health Survey (see bibliography) have referred to the height, weight, and skeletal maturity status of the children; but these measurements have not hitherto been reported in full. Compared with other ages, there are very few height and weight tables for preschool children. It is also alleged that there is a secular change in the size of children of given age (Clements 1953). Measurements of skeletal maturity status are extremely rare, and the present assessments are not only the first to be based on British children, but also the largest series to be published anywhere.

The aims of the Oxford Child Health Survey were described by Ryle (1948) and full details of recruitment and conduct have since been published. The original group of Survey children were born (in Oxford) between 1944 and 1948, and some younger brothers and sisters have since been added to the series. All the children were examined at the age of 6 months and thereafter at six-monthly intervals until they reached the age of 5. If, as a result of a mother altering the date of a clinical appointment, any weight or height was recorded as long as a fortnight before or a fortnight after the correct date, it has been excluded from the following tables. X-ray findings were excluded if they were taken more than a month before or after the correct date. The vast majority of records were taken on the day the child reached the stated age.

Height (table I)

Height was measured with the child standing barefoot. A few babies could stand at the age of 12 months; but it was not until they were 18 months that as many as half the children were able to coöperate, and not until 2 years that all the children could be measured.

TABLE I—STANDING HEIGHT (IN INCHES) OF OXFORD CHILD HEALTH SURVEY CHILDREN FROM 18 MONTHS TO 5 YEARS

Age (years)	Boys			Girls		
	No.	Mean	S.D.	No.	Mean	S.D.
1½	134	31·86	1·30	129	31·09	1·29
2	254	33·95	1·39	262	33·19	1·27
2½	240	35·62	1·44	259	35·08	1·45
3	242	37·28	1·60	263	36·71	1·45
3½	239	38·84	1·69	246	38·34	1·45
4	243	40·16	1·74	250	39·76	1·53
4½	224	41·52	1·79	238	41·04	1·60
5	234	42·75	1·90	238	42·38	1·72

Weight (table II)

When small the children were weighed naked, and at later ages they wore only a single layer of underclothes.

Skeletal Maturity Status (tables III and IV)

Skeletal maturity was assessed in two ways. The first method was to compare the X-ray films of the hands

with the standard hand films for stated ages published in Todd's atlas (1937). This method, by giving "skeletal age" to the nearest six months (three months for the youngest children), yielded a rather coarse grouping from which it was not possible to calculate valid standard deviations. However, the mean values shown in table III are probably satisfactory. The second method of assessing maturity status, which is described in detail elsewhere (Acheson 1954b), dispenses with the concept of skeletal age and, in the form of "Oxford maturity units," provides skeletal maturation with its own yardstick. This method yielded a relatively fine classification for the two hand films from which standard deviations, as well as means, could be calculated (table III). The same method was applied to both knees but in this case the frequency distributions were so irregular that they could only be characterised in terms of the mean and certain arbitrarily chosen percentile points (table IV).

DISCUSSION

In this country recent height and weight tables for the preschool child have been published by Gore and Palmer (1949) and by Low (1952). Neither of these sets of data are strictly comparable with ours. Low's figures are based on a longitudinal study of 66 boys and 60 girls born in Aberdeen nearly thirty years ago. These children were at all ages shorter and lighter than the Oxford children. Gore and Palmer's study is also on a much

TABLE II—WEIGHT (IN POUNDS) OF CHILDREN FROM BIRTH TO 5 YEARS

Age (years)	Boys			Girls		
	No.	Mean	S.D.	No.	Mean	S.D.
Birth	298	7·63	1·08	282	7·31	1·06
1/2	239	17·51	2·19	316	16·11	2·16
1	280	22·68	2·55	269	21·08	2·87
1 1/2	299	25·44	2·93	285	23·90	2·99
2	290	27·76	3·23	289	26·14	3·40
2 1/2	251	29·89	3·55	261	28·62	3·55
3	245	32·21	4·12	264	31·02	4·13
3 1/2	241	34·69	4·67	246	33·21	4·28
4	243	36·75	4·99	250	35·60	5·04
4 1/2	225	38·94	5·12	237	37·68	5·24
5	235	41·01	5·85	235	39·78	5·71

smaller scale than the Oxford Survey, and is based on measurements taken in a single year, 1947. Every age-group consists of a separate sample of children, and within each one there are differences of weeks or months between the ages of the individual children. These facts, preclude any exact comparison between their London children and the present series.

It will be noticed that the mean skeletal ages in table III are in every case less than the corresponding calendar ages. That is to say, the Oxford children were behind the schedule of maturation drawn up by Todd for

TABLE III—SKELETAL MATURITY ASSESSED FROM X-RAY FILMS OF HANDS AND WRISTS

Age (years)	No. of children		Todd method: mean "skeletal age" in months		Acheson method: [in Oxford maturity units] for the two hands (left and right)			
					Boys		Girls	
	Boys	Girls	Boys	Girls	Mean	S.D.	Mean	S.D.
1/2	336	343	5·2	4·0	5·3	2·3	5·7	2·6
1	354	296	9·2	8·4	8·9	3·6	11·1	4·2
1 1/2	315	306	14·6	13·5	13·8	4·7	18·4	4·9
2	313	305	20·8	18·2	18·9	4·7	23·4	4·6
2 1/2	257	276	27·1	24·8	23·3	5·3	27·6	4·8
3	268	276	33·1	32·7	27·1	5·7	31·5	6·1
3 1/2	254	252	37·4	38·3	30·6	5·4	35·7	6·7
4	265	261	42·2	45·9	33·5	6·4	40·0	7·4
4 1/2	235	243	48·5	52·9	36·7	6·2	44·2	7·9
5	250	244	54·4	58·9	39·0	6·9	48·1	7·9

TABLE IV—SKELETAL MATURITY ASSESSED FROM X-RAY FILMS OF KNEES

(Measurements [in Oxford maturity units] for the two knees (left and right))

Age (years)	No. of children		Boys		Girls	
	Boys	Girls	Mean	Spread	Mean	Spread
1/2	337	341	4·3	89% at 4	4·5	82% at 4
1	341	332	7·1	86% at 6–8	7·5	77% at 8
1 1/2	313	303	8·2	82% at 8	8·7	95% at 8–10
2	304	300	9·4	86% at 8–10	10·4	92% at 8–12
2 1/2	264	270	10·7	81% at 10–12	12·3	89% at 10–14
3	263	280	12·0	89% at 10–14	14·3	81% at 12–16
3 1/2	263	251	13·2	83% at 12–16	16·4	84% at 14–20
4	260	259	14·6	84% at 12–16	18·5	82% at 16–22
4 1/2	230	234	16·2	85% at 14–18	20·2	73% at 18–22
5	248	249	17·6	81% at 16–20	21·5	88% at 20–24

American children. The mean skeletal age for girls appears to overtake and pass that for boys, but it is thought that this results from an error in the Todd standards for girls (Acheson and Hewitt 1954b).

Shuttleworth (1937) has emphasised that the chief value of longitudinal growth surveys is that they permit an accurate study of increments. The Oxford material is being examined from this point of view, and some of the findings have already been published. At present a detailed study is being made of the effect of illness and adverse social circumstance on growth and skeletal development which, it is hoped, will throw further light upon the process of maturation, and make it possible to improve upon existing radiological methods of estimating maturity status.

The Oxford Child Health Survey began in 1944 and ran for ten years. It was initiated by the late Prof. John Ryle and supervised at first by him and later by Dr. Alice Stewart. Dr. Cicely Williams and Dr. Celia Westropp bore the brunt of the clinical and somatometric work, and Miss Elinor Roberts and Miss Margaret Barnes shared the task of X-raying the children. From 1944 to 1950 the Survey was financed solely by the Nuffield Provincial Hospitals Trust, but from 1951 onwards the Medical Research Council contributed generously towards its expenses.

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CUTANEOUS VASODILATATION DURING FAINTING

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IT is now generally agreed that the fall in blood-pressure during fainting results from peripheral vasodilatation rather than from any failure of cardiac function. During venesection cardiac output decreases, but if a faint ensues output does not decrease further (Barcroft et al. 1944). Lewis (1932) found that atropine abolished the bradycardia during fainting but had little effect on the hypotension or level of consciousness, and to emphasise the combined vagal and peripheral effects in these disturbances he used the term "vasovagal" attacks.

John Hunter (1793) observed that venous blood from the arm became bright scarlet during fainting. McDowall (1938) ascribed pallor of the face to general cutaneous vasoconstriction and concluded that the explanation of Hunter's finding was vasodilatation in the muscles. This hypothesis was seemingly confirmed by reports of vasodilatation in the forearm during posthæmorrhagic fainting (Barcroft et al. 1944, Barcroft and Edholm 1945) and emotional fainting (Greenfield 1951). However, measurements of skin blood-flow during fainting have not agreed with each other (Weiss et al. 1937, Barcroft and Edholm 1945, Rushmer 1944, Hertzmann 1954).

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We have witnessed nine fainting attacks, which were mostly emotional in origin. Measurements of heat elimination from the hand showed cutaneous vasodilatation invariably accompanied fainting.

Methods

Heat elimination from the hand was followed by means of the calorimeter described by Greenfield and Scarborough (1949). The subjects were seated with the arm dependent. Calorimeter-temperatures ranged from 28 to 33°C, but in any one experiment did not vary by more than 1°C. Room-temperatures were between 21 and 24°C and remained within ± 0·5°C during any one experiment. During seven faints sublingual and rectal temperatures were measured by copper-constantan thermocouples (Cranston et al. 1954), and blood-pressure was recorded by the auscultatory indirect method in five faints.

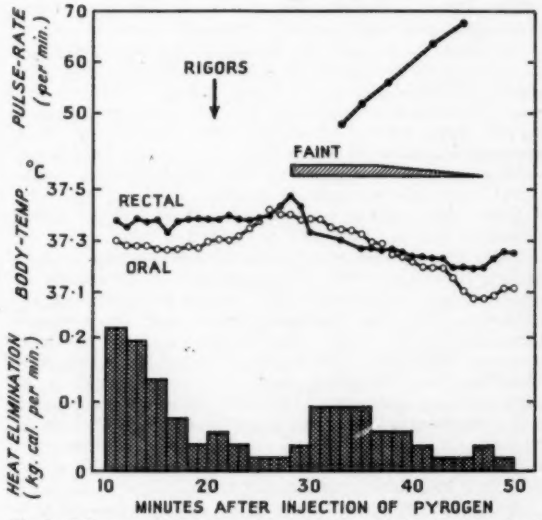

Fig. 1—Pulse-rate, body-temperature, and heat elimination from hand in subject B.

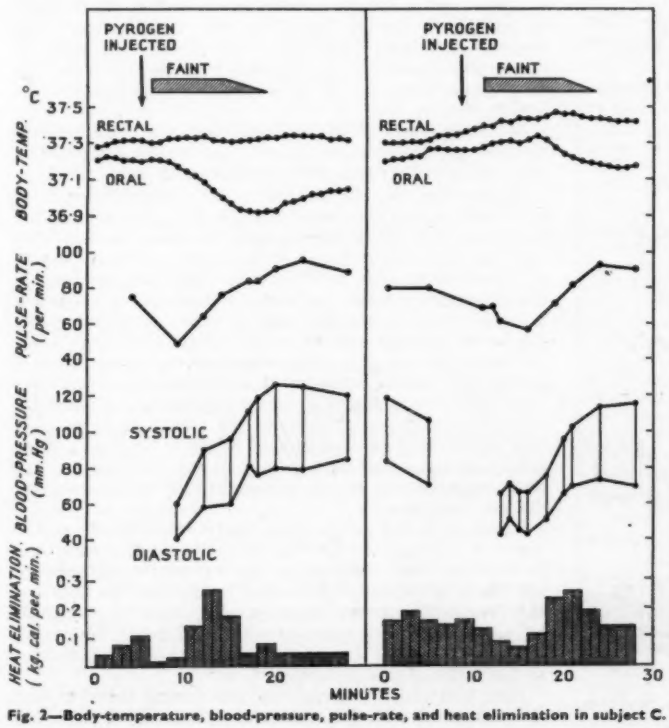

Fig. 2—Body-temperature, blood-pressure, pulse-rate, and heat elimination in subject C.

In one healthy woman student (subject A) three faints were deliberately provoked by puncturing an arm vein with a sharp needle and withdrawing 5 ml. of blood; she was seated on a high stool and the procedure was virtually painless. The remaining six faints occurred in five men incidentally after the intravenous injection of bacterial pyrogens, which had been incubated in the subject's own blood (Gerbrandy et al. 1954a). (The pyrogens were injected therapeutically in three men with eczema, and experimentally in two of ourselves.) The volumes of blood injected were 16–50 ml. in four experiments and 200 ml. in two. Four of the faints took place within ten minutes of the injection, and at least forty-five minutes before the onset of fever: the other two occurred twenty-eight and thirty-five minutes after injection, during the onset of fever.

Results

In none of the nine faints observed was there complete loss of consciousness. The first four faints observed were unexpected; in all of them the pulse slowed and became irregular, but blood-pressure was not

recorded. Heat elimination increased in all, including two subjects who were developing a fever with rigors and powerful vasoconstriction. The observed changes in subject (B) are shown in fig. 1, the abscissa of which represents the time after the injection of 50 million *Escherichia coli* in 16 ml. of blood. The ensuing fever was associated with a fall of heat elimination to very low levels, rigors, and a small rise in mouth and rectal temperatures. At this time he fainted; the pulse-rate was then 48 per min., and heat elimination increased to 0·09 calories per kg. per min.; at the same time there was a fall in oral and rectal temperatures. During recovery from the faint, heat elimination decreased and the pulse-rate rose.

Subject C fainted on two separate occasions, after the injection of 50 million *Esch. coli* in 30 ml. of blood, and the results are shown in fig. 2. Both faints took place at least forty-five minutes before fever began. During each attack there was a small transient decrease in heat elimination, followed by a large rise; blood-pressure, pulse-rate, and oral temperature all decreased, while rectal temperature remained steady.

The findings in the first experiment on subject A are shown in fig. 3. First she witnessed a venesection on someone else; about 50 ml. of blood was run into a bottle and on to white towels. This occasioned some emotional reaction, but no fainting; the fall in heat elimination indicates cutaneous vasoconstriction, and there was a transient rise in systolic blood-pressure. 5 ml. of blood was next withdrawn from a vein in the subject's own arm. This provoked fainting, with weakness, clouding of consciousness, and pallor of the face, followed by sweating and hyperventilation. The blood-pressure fell by about 30 mm. Hg, and there was a small decrease in pulse-rate and oral temperature. Heat elimination rose from about 0·15 to 0·25 calories per kg. per min.

A further experiment on subject A is shown in fig. 4. 5 ml. of blood was withdrawn from the subject, provoking a fairly severe and lengthy fainting reaction, with the same features as before. Blood-pressure fell to very low levels, but there was only transient bradycardia. Heat elimination rose to about three times its basal level, and stayed up until the blood-pressure was increased by raising the legs. The legs were again lowered, and this was followed by a milder faint with cutaneous vasodilatation during the period of hypotension.

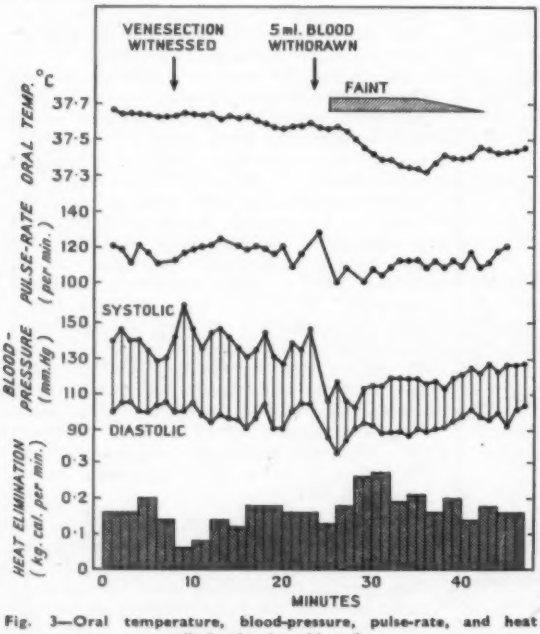

Fig. 3—Oral temperature, blood-pressure, pulse-rate, and heat elimination in subject A.

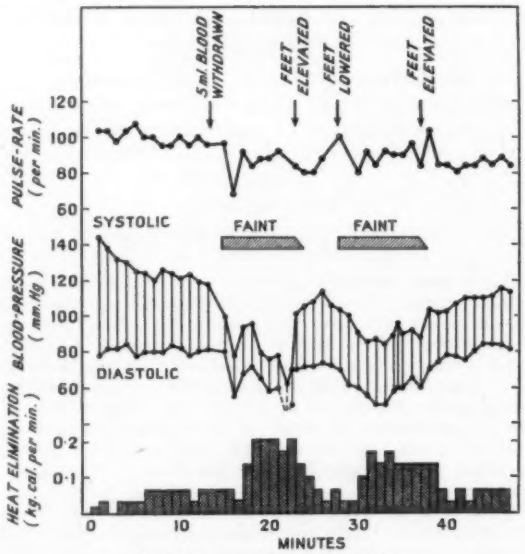

Fig. 4—Observations on subject A.

Discussion

The three faints observed in subject A were presumably almost entirely emotional in origin. In the other subjects fainting occurred even if local anæsthesia had been given before the injection, so their responses cannot be entirely attributed to pain. Fainting occurred in six out of forty-six experiments in which pyrogen in blood was injected intravenously, and emotional factors are thought to have been mainly responsible for the attacks. The general symptoms associated with the abrupt onset of fever may have played some part in precipitating the two faints twenty-eight and thirty-five minutes after the injections.

Normally there is loss of heat from the limb arteries to their venæ comitantes (Bazett et al. 1948), and presumably also to other surrounding structures. It is theoretically possible that the increase of heat elimination from the hand during fainting might be due to a rise in the temperature of the blood reaching the hand. A slight rise in this temperature might result from vasodilatation in the forearm muscles, but this alone could not account for the observed increase in heat elimination. It is much more likely that our findings indicate cutaneous vasodilatation in the hand during fainting. This vasodilatation must be even grosser than the figures suggest, because it persisted in the presence of a lowered blood-pressure. Vasodilatation occurred even during periods of powerful cutaneous vasoconstriction, at the onset of fever. It was not related to injection of pyrogen or blood, since similar increase in heat elimination was not observed in forty experiments of the same type in which fainting did not take place.

There is a lag of at least one minute between the onset of vascular changes in the hand and any variatons in recorded heat elimination, but otherwise calorimetry has fewer drawbacks than other methods as an index of skin blood-flow during fainting. The time-relationships between changes in blood-pressure and heat elimination (figs. 1–4) suggest that skin vasodilatation contributes to the fall of blood-pressure.

Oral temperature invariably fell during fainting, but the extent of this fall does not necessarily reflect the

effects of increased heat elimination on arterial blood temperature. We have previously observed during the onset of fever large falls in oral temperature with powerful cutaneous vasoconstriction (Cranston et al. 1954); these changes were attributed to a reduction in the rate of blood-flow through the mouth. The changes in oral temperature during fainting may be partly produced in the same way. Rectal temperature fell during one faint, and was unchanged in the others, but it has been previously shown that rectal temperature responds poorly to changes in body-heat (Gerbrandy et al. 1954b). A decrease in cutaneous blood-flow during fainting has been reported by Barcroft and Edholm (1945) and by Weiss et al. (1937). Barcroft and Edholm induced fainting by reducing the circulating blood-volume; Weiss et al. used a combination of sodium nitrite and tilting. In both of these investigations blood-flow was measured by a hand plethysmograph. During periods of hypotension the usual pressure in the collecting cuff may approach or exceed arterial pressure. Thus an artificially low blood-flow may be recorded by this method. Barcroft and Edholm (1945) attempted to overcome this difficulty by decreasing the collecting pressure during the faint; the changes in blood-flow which they depicted were inconstant, and were probably affected by the reduction of blood-volume. In none of our experiments was reduction of blood-volume induced by venesection or leg cuffs.

Rushmer (1944) followed the pulse-volume in the finger during forty-five arterial punctures. Fifteen of his subjects fainted, though most of the punctures were painless and little blood was withdrawn; in all of these subjects pulse-volume increased during the faint. Hertzman (1954) recorded a similar observation in one case. This evidence is in favour of cutaneous vasodilatation during fainting.

The cutaneous vasodilatation during emotional fainting may affect forearm blood-flow. Under resting conditions skin blood-flow accounts for 0–67·5% of total forearm blood-flow, and this proportion increases as skin-flow increases (Cooper et al. 1954). It therefore cannot be assumed that Greenfield's findings provide conclusive evidence for muscle vasodilatation during emotional fainting. Posthæmorrhagic fainting may be associated with different circulatory effects, and the increased forearm flow observed in this condition may be partly in the muscles.

Summary

Heat elimination from the hand has been measured during nine faints in six subjects. Six attacks followed intravenous injections of pyrogen in blood. Two occurred during the onset of fever; and the remainder were emotional in origin.

During all the faints cutaneous vasodilatation developed, judged by increased heat elimination from the hand.

Sublingual temperature fell during fainting, but with one exception rectal temperature remained constant.

Cutaneous vasodilatation contributes to the fall of blood-pressure during emotional fainting.

We are indebted to Prof. G. W. Pickering and to Dr. G. Mitchell Heggs, physician in charge of the skin department, for permission to observe their patients who were undergoing fever therapy. We are also most grateful to subject A for her willing coöperation.

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PSORIASIS SPONDYLITICA

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Essentia non sunt multiplicanda præter necessitatem—
William of Occam (d. *c.* 1349)

THAT psoriasis is particularly common in patients with rheumatoid arthritis has long been recognised, but a similar association between psoriasis and ankylosing spondylitis is not widely recorded. Cases of ankylosing spondylitis with psoriasis have—particularly in American accounts—been called "psoriasis arthropathica with sacro-iliac joint involvement." Coste and Forestier (1935) stated that it was rare to find ankylosing spondylitis complicated by psoriasis. Bouwens van der Boijens (1939) classified psoriasis arthropathica into eight types, one being the type associated with spondylitis; this he considered very rare. Epstein (1939) found 1 case of sacro-iliac joint involvement in 39 cases of psoriasis arthropathica. Of 150 cases of psoriasis arthropathica reported by Vilanova and Pinol (1951), 3 males had sacro-iliac joint involvement. They found that skin lesions were common over the trunk in spinal cases, and that these had a worse prognosis. Sherman (1952), reporting 15 cases of psoriasis arthropathica, noted 1 male who had had ankylosing spondylitis for forty years before the onset of psoriasis and peripheral joint involvement. Sterne and Schneider (1953), reporting 6 males with psoriasis arthropathica, mentioned 2 with sacro-iliac joint involvement; in both the peripheral joints were affected, but in only 1 did the skin lesion involve the trunk.

In 100 consecutive unselected cases of ankylosing spondylitis, we found 4 with psoriasis. Since the incidence of psoriasis in the population is about 0·3% (Arnsø and Clemmesen 1952) there would thus appear to be an association between ankylosing spondylitis and psoriasis comparable to that between rheumatoid arthritis and psoriasis. By analogy with psoriasis arthropathica this association may be called psoriasis spondylitica.

Case-reports

Case 1 was a woman, aged 39, who had developed psoriasis at the age of 11. When 25 years of age she complained of backache following the birth of her first child; this continued for fourteen years, becoming more severe with increasing limitation of spinal movement; latterly her right hip and shoulder had become painful. 3 brothers and 1 uncle had ankylosing spondylitis.

On examination her chest expansion was normal. There was a dorsal kyphosis, lumbar lordosis, and limitation of movement of the lumbar spine; she was unable to reach within 4 in. of her toes. There were plaques of psoriasis on both knees. The erythrocyte-sedimentation rate (E.S.R.) was 31 mm. in the first hour (Westergren). Radiography revealed squaring of the mid-dorsal vertebræ, and irregularity and sclerosis of the sacro-iliac joints.

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Case 2 was a man, aged 37, who worked as a post-office clerk. At 15 he had developed psoriasis. 4 years later he complained of pain in both buttocks, localised to the ischial tuberosities and radiating down the backs of both thighs. At the age of 23 he entered the Army and was placed in grade I, but a week later he again developed pains in the buttocks; these pains became severe and he was transferred to grade III. A few months later he was referred to a psychiatrist and was discharged from the Army with "rheumatism and nerves." When he was 24 he began to have pain between the shoulder-blades which was diagnosed as fibrositis and treated with infra-red radiation and massage. The pain in the buttocks and shoulder-blades continued until the age of 29, when he developed pain and stiffness in the lower part of his spine; this was diagnosed as lumbago and treated with radiant heat. The pain persisted until the age of 32, when ankylosing spondylitis was diagnosed. He was treated with deep X rays with relief of symptoms. His paternal grandfather, father, mother, and a brother have psoriasis.

On examination his chest expansion was 2 in., the spine was stiff, and he was not able to reach within 12 in. of his toes. There was an upper dorsal kyphoscoliosis with obliteration of lumbar lordosis. There were small patches of psoriasis on both elbows and knees. The E.S.R. was 22 mm. in the first hour (Westergren). Radiography revealed ankylosis of both sacro-iliac joints and bambooing of the lower dorsal spine.

Case 3 was a man, aged 29, who at the age of 17 had developed psoriasis on the extensor surfaces of both forearms. At 18 he entered the Army and was placed in grade I. A year later he developed pain in his left hip, worse on sitting down, and at the age of 20 he was admitted to hospital with a diagnosis of tuberculosis of the left hip. The following year the pain spread to his right hip, and then to knees and elbows. He was treated with gold injections but without improvement.

At the age of 22 there was severe deterioration in his condition. On examination at that time, the chest expansion was $1^1/_2$ in., the skin was atrophic, and there were plaques of psoriasis over the elbows and knees. There was ulnar deviation of his hands, and his elbows were swollen; movements of the shoulders, hips, and spine were severely limited. The E.S.R. was 88 mm. in the first hour (Westergren). Radiography of the pelvis showed obliteration of the sacro-iliac joints. The peripheral joints were treated with deep X rays but without improvement.

At the age of 24 bilateral iritis developed and the patient became bedridden. He was admitted to a chronic hospital where he now lies, aged 29, blind and completely helpless.

Case 4 was a man, aged 76, who had developed psoriasis at the age of 30 on both elbows and knees. At the age of 64 he complained of stiffness of the neck and shoulders, low back pain, and difficulty in walking. He carried on work for four years until his hips became affected. Radiographs at the age of 70 showed destruction of both sacro-iliac joints and protrusio acetabuli of both hip-joints. He was treated with deep X rays with some improvement. A maternal aunt had suffered from rheumatoid arthritis.

On examination when he was aged 75 he appeared younger than his years. There were patches of psoriasis on the left wrist and on the left buttock and natal cleft; and the movements of both wrists were limited. The E.S.R. was 30 mm. in the first hour (Westergren). At the age of 75 radiography of his hands showed destruction of the carpal joints, but the terminal interphalangeal joints were not affected.

Discussion

Rheumatoid Arthritis and Psoriasis

The incidence of psoriasis in rheumatoid arthritis has been variously estimated at 2·6% (Dawson and Tyson 1938), 3·1% (Fletcher 1951), and 4% (Douthwaite 1935). Sherman (1952) stated that ulnar deviation is not seen in true psoriatic arthropathy, and Epstein (1939) said that iritis is never found; but case 3, in which there was fulminating ankylosing spondylitis with peripheral joint involvement and psoriasis, showed both these complications.

Rheumatoid Arthritis and Ankylosing Spondylitis

Because in some 25% of cases of ankylosing spondylitis the peripheral joints are involved, and the macroscopic and microscopic appearance of the joints is the same in rheumatoid arthritis as in ankylosing spondylitis, ankylosing spondylitis is sometimes thought to be nothing more than rheumatoid arthritis affecting the spine. But for the following reasons the two conditions are considered, at least in Europe, to be distinct:

(1) *Sex-incidence.*—Whereas rheumatoid arthritis is commoner in females (3 : 1), ankylosing spondylitis is commoner in males (6 : 1).

(2) *Age-incidence.*—Rheumatoid arthritis may appear at any age, whereas ankylosing spondylitis most often starts in the 15–40 age-group.

(3) *Course and prognosis.*—Ankylosing spondylitis is more benign, most patients being able to continue at work. Rheumatoid arthritis is characterised by more frequent remissions and relapses, 15% of patients becoming bedridden.

(4) *Treatment.*—Rheumatoid joints do not respond to deep X-ray therapy, whereas the involved joints in ankylosing spondylitis do.

(5) *Complications.*—Necrobiotic nodules are hardly ever found in ankylosing spondylitis, but some 20% of patients with rheumatoid arthritis are so affected. Moreover the incidence of iritis is greater in ankylosing spondylitis—15% in ankylosing spondylitis as against 5% in rheumatoid arthritis.

Ankylosing Spondylitis and Psoriasis

Arnsø and Clemmesen (1952) found psoriasis in 2 of 20 cases of ankylosing spondylitis—an incidence of 10%, which is far higher than the incidence of 4% in our own series. Psoriasis usually appears before rheumatoid arthritis in psoriasis arthropathica (Sterne and Schneider 1953), and in each of the 4 cases reported here the psoriasis developed before the onset of ankylosing spondylitis; the skin lesions were confined in all 4 cases to a few plaques over the knees and elbows. Some cases of psoriasis arthropathica have a distinct clinical pattern with involvement of the terminal interphalageal joints, which is rarely seen in rheumatoid arthritis without psoriasis; but in the 4 cases of ankylosing spondylitis with psoriasis reported here the spondylitis was clinically indistinguishable from ankylosing spondylitis without psoriasis.

Genetic influences play a part in the ætiology of both ankylosing spondylitis (Jacobs and Rose 1954) and psoriasis (Lerner 1940), as is shown by the family histories of cases 1 and 2. The former had 4 relatives (paternal uncle and 3 brothers) with ankylosing spondylitis, but none with psoriasis; and case 2 had 4 relatives (paternal grandfather, father, mother, and brother) with psoriasis, but none with ankylosing spondylitis.

Ankylosing spondylitis often remains misdiagnosed for many years. In view of this we suggest that if a patient with psoriasis complains of pain referable to the locomotor system, the sacro-iliac joints should be radiographed.

Summary

4 cases of ankylosing spondylitis associated with psoriasis are reported.

The relationship of ankylosing spondylitis, rheumatoid arthritis, and psoriasis to each other is discussed.

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LYMPHOCYTIC CHORIOMENINGITIS IN THE NEWBORN

PROBABLE TRANSPLACENTAL INFECTION

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Two foci of lymphocytic choriomeningitis (L.C.M.) infection in Manchester were described by Duncan et al. (1951), and since then other cases have occurred in these two areas. The case here reported in a newborn is the first recorded in infancy, and evidence is presented that infection was acquired during the last stages of intra-uterine life. The mother was resident in one of the areas mentioned.

Case-history

A baby boy was born on June 4, 1954. His mother had borne three other children, who had been perfectly normal and thrived well. The mother was admitted to hospital on May 27, 1954, eight days before delivery, with four days' history of malaise, headache, and vomiting. On the day of admission she experienced some suprapubic pain and frequency of micturition; there was no dysuria, but very little urine was passed.

On examination she had a cough and fever (temperature 103·8°F, pulse-rate 130), and there were generalised signs of bronchitis; the blood-pressure was 120/80 mm. Hg, and the fauces were mildly inflamed. Otherwise the examination was stated to be normal.

Investigations.—Blood-cultures, radiography of the chest, Widal and Paul-Bunnell reactions, and repeated cultures of the urine had not elucidated the cause of the mother's condition by June 4. So the baby was immediately segregated at birth and not again brought into contact with the mother, who continued to have a hectic swinging temperature and was transferred to another hospital, where on June 16, twelve days after the delivery, the diagnosis of benign L.C.M. was suggested on the basis of a slight increase of cells and protein in the cerebrospinal fluid (C.S.F.). This was subsequently confirmed serologically, the complement-fixing antibody titre of her serum rising from less than 1/2 to 1/64.

The infant weighed 6 lb. 1 oz. at birth and appeared to be normal, passing urine and meconium on the first day. He seemed to be well for the first six days because he fed satisfactorily and was active, having a normal Moro and grasp reflex; but he lost 10 oz. in weight, and by the eighth day $3^1/_2$ oz. more. By this time his temperature had begun to rise, and he was sucking indifferently and was a little dehydrated.

Investigations and Treatment.—Aureomycin therapy (25 mg. four-hourly) was started. A white-cell count of 31,900 per c.mm. (polymorphs 29%, lymphocytes 52%) suggested an active infection, and streptomycin 125 mg. daily was added to the therapy. Tube feeding was started and subcutaneous saline solution was administered. The general condition remained stationary until June 15, when the infant's condition deteriorated and he had a convulsion. Examination revealed some neck stiffness. Cisternal puncture produced clear xanthrochromic C.S.F. containing 4000 red cells and 54 white cells per c.mm. (36 polymorphs and 18 lymphocytes per c.mm.) and protein 150 mg. per 100 ml. The possibility of virus meningitis or inclusion disease was considered at this stage.

Course.—There was rapid deterioration in the infant's condition, and in six hours' time the fontanelle was bulging and the baby showed severe opisthotonos. Cisternal and ventricular taps on this occasion revealed evenly bloodstained C.S.F. indicating subarachnoid hæmorrhage, and the child died three hours later on June 16, 1954, aged twelve days. A necropsy was done by one of us (B. L. W.) next day.

Necropsy Findings.—The body was that of a mature male infant weighing 4 lb. 15 oz. and showing some wasting and dehydration. Petechiæ were present on the lower abdominal wall, groins, and scrotum. The *skull* was healthy, with normal fontanelles. The *brain* weighed 360 g. and appeared swollen. There was extensive subarachnoid hæmorrhage over the left cerebral hemisphere and in the cisterna magna. On section the third and fourth ventricles and both lateral ventricles were moderately dilated and contained blood; the cut surface of the brain showed faint yellow discoloration. Situated in the occipital lobe of the right cerebral hemisphere, lateral to the posterior horn of the lateral ventricle, was an area of intracerebral hæmorrhage 2 cm. in diameter and communicating with the lateral ventricle. Macroscopic examination of the *thoracic* and *abdominal viscera* showed no abnormality.

Microscopy.—At the site of intracerebral hæmorrhage there was destruction of the brain tissue; adjacent brain tissue showed œdema, capillary congestion, and sparse infiltration by macrophages. Overlying the left cerebral hemisphere and in the cisterna magna was hæmorrhage into the subarachnoid space. Remote from the intracerebral and subarachnoid hæmorrhage the leptomeninges were congested, and the subarachnoid space showed moderately severe lymphocytic infiltration. There was also lymphocytic infiltration beneath the ependyma of the third and fourth and lateral ventricles. Occasional blood-vessels showed sparse perivascular lymphocytic cuffing. Other tissues showed no significant abnormalities. No obvious cause was found for the intracranial hæmorrhage, which was thought to be due either to direct trauma (this seems unlikely in view of the situation) or, more probably, to change of intracranial pressure following the first cisternal puncture.

Virological Investigations.—A specimen of C.S.F. taken from the infant on June 15, 1954, was inoculated intracerebrally into mice from a L.C.M.-free stock and intraperitoneally into guineapigs. Eight days after inoculation the mice were sick, with symptoms described by Traub (1936) as typical of L.C.M. A suspension of brain material from sick mice of this group was specifically neutralised by L.C.M.-immune serum. Complement-fixing antigen prepared from the spleen of one of the two guineapigs killed on the sixth day after injection was also specific for L.C.M. The second guineapig, bled from the heart fourteen days after inoculation, showed L.C.M. complement-fixing antibody in its serum. L.C.M. virus was also isolated from four pools of house mice caught in the mother's home.

Discussion

Transplacental infection with L.C.M. virus has not hitherto been recorded, although Traub (1939) and Haas (1941) have shown that it is the normal mechanism of infection in colonies of mice where the disease is enzootic.

In the present case, since the infant was separated from the mother immediately after delivery, no possibility of postnatal infection exists. The possibility of paranatal infection must be borne in mind because it has often been stated that the urine in cases of human L.C.M. may contain the virus, and thus the birth canal may have been contaminated. Although it is well established that the virus is excreted in the urine of infected mice (Traub 1936), only one report has been published of the isolation of L.C.M. virus from the urine in man; this is by Lépine and Sautter (1938) and appears to be of dubious validity.

It therefore seems that transplacental infection was by far the most likely route in the present case, particularly in view of the fact that the major phase of the mother's illness occurred at least a week before delivery. In this connection it is of interest to mention that Swarts and Kercher (1954) have published a case of transplacental infection with poliomyelitis virus.

In further support of this view is the time of onset of the baby's illness. The incubation period of L.C.M. in man under natural conditions is extremely hard to establish, because in most cases there is repeated exposure in the home environment. van Rooyen and Rhodes (1948) give it as one to three weeks. In the two cases of laboratory infection reported by Milzer and Levinson (1942) and Lépine and Sautter (1938) the most likely times of infection were six and ten days respectively before the onset of disease, though both cases were continuously exposed to the possibility of infection before these times. In one of the cases of Smadel et al. (1942)

the infection was apparently acquired while conducting a necropsy in a human case eight days before the onset of illness. In all these three cases it is probable that infection was by an artificial route. In the present case the onset of illness was only six days after birth, and we consider it most likely that infection was acquired during intra-uterine life.

Summary

A case of lymphocytic choriomeningitis in a newborn infant is reported.

The probability of transplacental infection is discussed.

Our thanks are due to Dr. C. S. D. Don and Dr. J. W. A. Hunter for access to the mother's case-notes, and to Dr. M. O. Adams for doing complement-fixation tests on the mother's serum and for investigating the house mice.

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THE DIRECT FLOCCULATION OF INFLUENZA VIRUS

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M.B. Lond.

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BY reason of its technical simplicity the direct agglutination reaction has been the serological technique of choice in both diagnostic and experimental bacteriology. In virology, however, its use has been restricted to the study of the plant viruses (Beale 1934, Bawden 1935), certain of the larger animal viruses, including the rickettsiæ (Otto and Dietrich 1917, Zinsser and Ruiz Castañeda 1932, Van Rooyen and Bearcroft 1943) and vaccinia (Ledingham 1931, Craigie and Tulloch 1931).

Agglutination of influenza virus was first reported over fifteen years ago (Magill and Francis 1938); but apart from additional observations by Henle and Chambers (1941) there has been no further development of this technique either as an adjunct to laboratory diagnosis or as a research tool. Such a possibility was suggested by the chance observation of typical flocculation in mixtures of highly purified virus and specific serum. I describe here the preliminary stages of an investigation designed to this end.

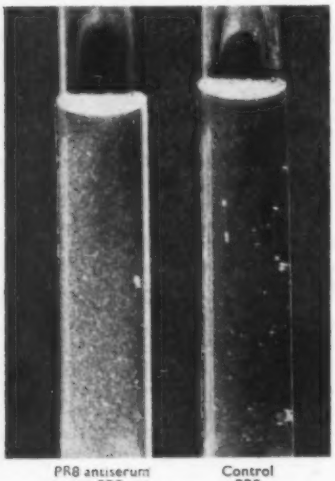

Fig. 1—Flocculation of eluate preparation of PR8 virus by homologous antiserum after 2½ hours at 37°C.

Materials and Methods

Antigens

The following strains of influenza virus were used:

Type A: PR8, received from the National Institute of Medical Research in 1947.

Type A "prime": FMI, obtained by the courtesy of Dr. C. H. Andrewes from the World Influenza Centre.

MW, isolated in this laboratory in 1951 (Smith et al. 1951).

Ashby, isolated in this laboratory in 1953 and identified at the World Influenza Centre as a "Scandinavian" subtype (Isaacs and Andrewes 1951).

Type B: Lee, received from the National Institute of Medical Research in 1947.

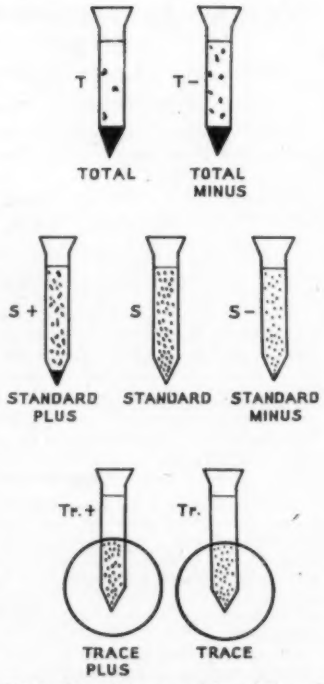

Fig. 2—Defined degrees of flocculation of virus.

Viruses were grown by the allantoic inoculation of 11-day-old embryonated eggs with suitable doses of seed stocks kept at −70°C. They were used either as infected allantoic fluids or as partially purified and concentrated suspensions of virus in saline solution. Purification and concentration were achieved by either high-speed centrifugation or a single cycle of adsorption and elution from human red cells (Sheffield et al. 1954). Normal allantoic fluids clarified by centrifugation were also included as control antigens in certain experiments. When necessary, antigen preparations were stored at 2°C, and they retained their flocculability under these conditions for up to 6 or 8 months.

Sera

Rabbits were immunised by two intravenous injections of purified virus given at an interval of three weeks. The first injection was small, usually about 300 hæmagglutinating doses, and the second about ten times as great. Samples of serum were taken at convenient intervals after the first and second injections of antigen.

All the sera were inactivated at 56°C for 30 minutes and stored at −10°C without preservative.

Hæmagglutination

Virus antigens were conveniently standardised for potency by hæmagglutination titration against fowl cells by the method of Belyavin et al. (1951). The titres of serum which inhibited hæmagglutination by 4 agglutinating doses (A.D.) of virus were estimated by a similar technique.

Serum Absorptions

Virus, deposited from saline suspension by high-speed centrifugation, was resuspended in appropriate aliquots of sera diluted 1/10 with physiological saline solution, and the mixtures were held at 4°C overnight. Next day the virus-serum mixtures were centrifuged at 22,000 G for 1 hour to sediment the absorbing antigen. The supernatant fluids constituted the absorbed antisera.

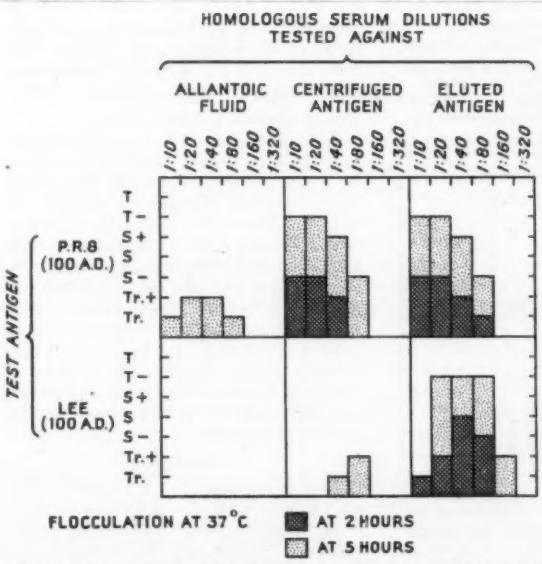

Fig. 3—Relative speeds of flocculation of different preparations of influenza virus.

Flocculation

Technique

Equal volumes (0·3 ml.) of virus antigen and of serially diluted immune serum were mixed in Dreyer's tubes. The serum dilutions were pipetted first, the virus antigen being added subsequently, as in a bacterial agglutination test. Orthodox controls containing only physiological saline solution and virus antigen were included in each test. The rack was next placed in a water-bath at 37°C, the water level being adjusted to fall approximately between a third and a half of the way up the fluid column. The tubes were inspected in a viewing-box at short intervals.

Development of Particulation

With suitable concentrations of antigen and serum there is a characteristic sequence of events. Within a few minutes after the tubes have been placed in the water-bath at 37°C a faint opalescence develops, which increases with time. Eventually a fine granular precipitate forms; this is visible for a time only with a hand-lens but develops subsequently into a well-marked flocculation clearly visible to the naked eye. It closely resembles a bacterial "somatic" agglutination (fig. 1), the floccules sinking eventually to the bottom of the tube. With a given antigen and antiserum a certain relative proportion of the two components gives the most rapidly particulating mixture, and flocculation inhibition zones occur in the region of gross antibody or antigen excess. Mixtures in the antibody-excess zones usually show intense opalescence. In these respects the reaction therefore behaves in the manner of a classical precipitin test. Reduction of the amount of virus antigen added in a constant antigen titration leads to a smaller over-all bulk of flocculum, and the lowest concentration of antigen usable seems to be limited only by the detectability of the precipitate formed. Antigen concentrations containing about 10–20 hæmagglutinating doses of virus per ml. appear to be at the practical limit.

Recording Degree of Particulation

In applying and studying this reaction it was found convenient to record the degree of flocculation observed in terms of a modified Dreyer's notation (Dreyer and Inman 1917). The defined degrees of flocculation are illustrated in fig. 2.

Effect of Virus Purification on Flocculation

Comparisons were made between the flocculability of infected allantoic fluid, high-speed centrifugate, and eluted virus. In each case an infected allantoic fluid was divided into three equal parts: one part was clarified by centrifugation at 8000 G for 15 minutes; one part was purified and concentrated fivefold by high-speed centrifugation; and the third part was treated by a single cycle of adsorption and elution also with fivefold concentration. Samples of each preparation,

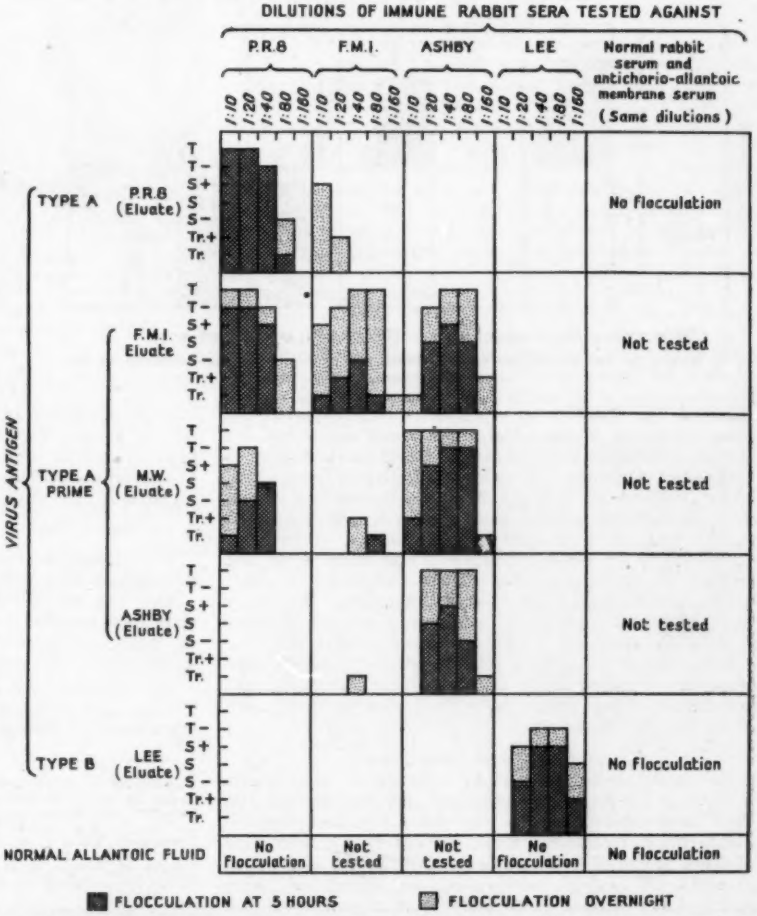

Fig. 4—Cross-flocculation reactions of five strains of influenza virus with their respective antisera, and control tests (summarised from two experiments).

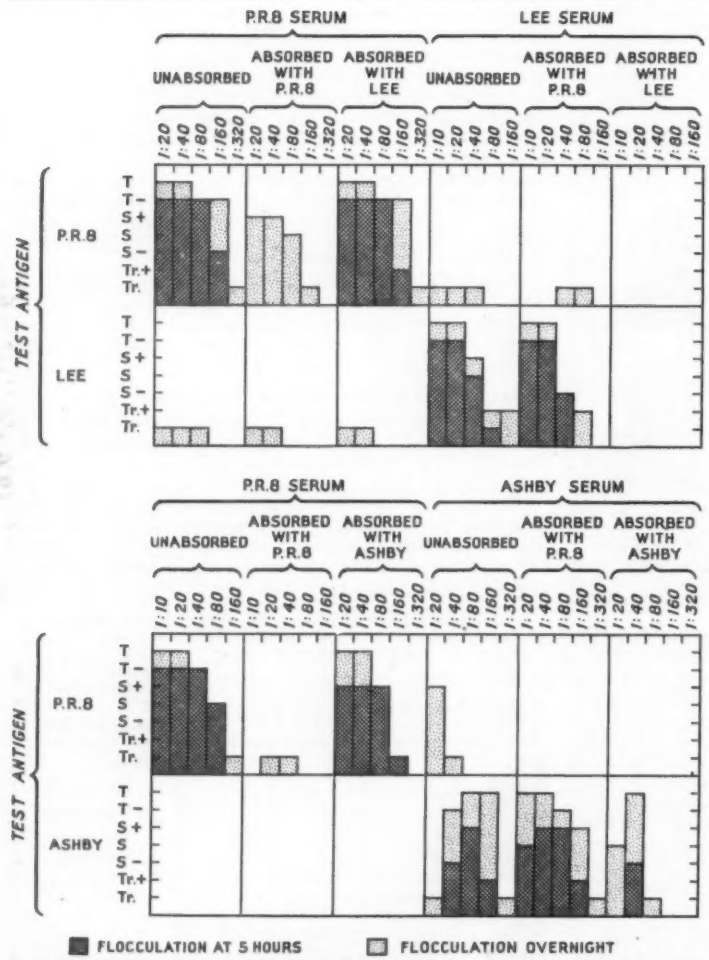

Fig. 5—Results of two cross-absorption experiments using flocculation reaction to test absorbed sera.

adjusted by dilution to equivalent concentrations of virus in terms of hæmagglutinin, were compared for flocculability against serial bulk dilutions of homologous antiserum. This was done using the PR8 and Lee strains, and an example of each (fig. 3) shows the over-all superiority of partially purified suspensions, which is notable in the case of some eluted preparations. The poor flocculability of crude allantoic fluids relative to the purified virus suggests the presence of some material in the former which inhibits the reactions. Probably such inhibitors present in crude preparations of virus explain the equivocal results of former workers.

Experiments made with virus suspended in borate- and phosphate-buffered saline solution showed that the rate and degree of flocculation were unaffected by differences of pH between 6 and 8.

Specificity of Reaction

Reciprocal cross-flocculation experiments were made with virus strains of distinguishable serological type and their homologous antisera. In several of these experiments normal allantoic fluid, normal rabbit sera, and antisera prepared by immunisation of rabbits with saline extracts of normal chorio-allantoic membrane were included as controls. These latter were known to contain potent complement-fixing antibodies against membrane antigens. The results of two such experiments (summarised in fig. 4) show clearly the specificity of the reaction and the closeness with which it parallels the known serological pattern of the strains involved.

Serum Cross-absorption Tests

The results of the cross-flocculation experiments were further confirmed by making reciprocal cross-absorption tests between viruses of distinguishable serological type and their respective antisera. The absorbed sera were tested by full reciprocal cross-flocculation reactions. Two such experiments between a type-A strain (PR8) and a type-B strain (Lee) and between a type-A strain (PR8) and an A-prime strain (Ashby) are illustrated in fig. 5. These experiments fully confirmed the specificity of the direct cross-flocculation experiments.

Discussion

The experiments described show that the elementary particles of influenza virus are flocculated by specific antibodies. Such a reaction has several practical applications. A direct flocculation test of this nature, simple to perform and economical in apparatus and labour, will surely be of value in the routine serological typing of influenza virus. Similarly, it may be applicable in the examination of post-influenza convalescent sera and post-vaccination sera, and a few preliminary experiments in this field encourage the view that this may be possible. In a more academic field the technique provides another tool for the investigation of the nature and properties of the influenza viruses. It may also be confidently anticipated that similar direct flocculation of many other animal viruses will be possible, provided that sufficiently purified and concentrated suspensions of virus can be prepared. If they can, investigations of the effects of antigenic particle size on the dynamics of the specific precipitation reaction will be greatly facilitated. For this reason, and in the hope of meeting urgent practical needs, the applicability of the present findings to the very small virus of poliomyelitis is now under investigation.

Summary

The technique of a simple quantitative influenza-virus flocculation test, using immune rabbit sera, is described.

The results of experiments which demonstrate its serological specificity and its inhibition by factors present in normal allantoic fluid are presented, and their significance is discussed.

I am indebted to Prof. Wilson Smith for his critical advice. The expenses of this work were defrayed by a departmental grant from the Medical Research Council.

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DEPOSITION OF IRON IN THE TESTES AFTER ADMINISTRATION OF AN IRON-DEXTRAN COMPLEX

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PREVIOUS work with different iron preparations has shown that both the immediate and the later fate of iron in the body varies considerably, depending not only on the size of the particle but also on the chemical nature of the non-ionised compound (Nissim 1949, 1953a). The study of iron uptake by the testis in experimental siderosis was stimulated by the earlier finding of a close correspondence in the distribution of saccharated iron oxide and of ascorbic acid in many organs (Nissim 1952a). It was found, however, that, although iron appeared in a few histiocytes scattered among the interstitial tissue

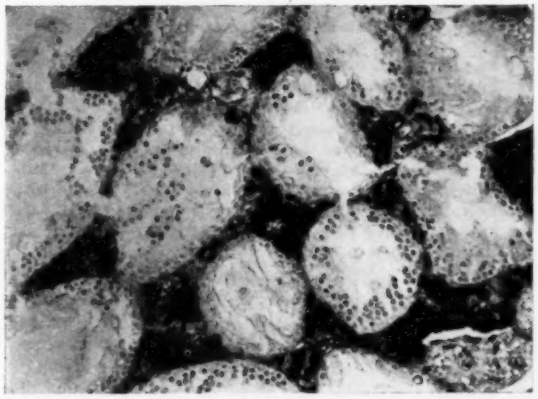

Fig. 1—Testis of mouse showing massive deposition of iron in proliferated interstitial tissue with severe degeneration of seminiferous tubules and absence of spermatozoa after administration of 3 g. of iron (as imferon) per kg. of body-weight in six intravenous injections given twice weekly. Mouse was killed 11 weeks after last injection. (Prussian-blue and carmalum. × 148.)

of the testis in a few days after the intravenous injection of saccharated iron oxide, most of the interstitial cells, presumably endocrine, remained entirely free from iron. In later work moderate uptake of iron by the endocrine interstitial cells was noted after repeated injections of the diffusible preparations ferric hydroxide ferrous ascorbate and ferric chloride caramelate (Nissim 1953b).

I report here the striking deposition of iron in the interstitial cells of the testis after the administration of the iron-dextran complex 'Imferon,' a deposition more massive than that in any other organ in the body.

Methods

The iron-dextran complex was injected intravenously into white adult male mice in doses of 0·5 g. of iron per kg. of body-weight weekly or twice weekly. Some mice received similar doses subcutaneously. Sections of the testes were studied at 3, 4, and 24 hours, 4 days, and 2 weeks after single doses. The total amount of iron given in repeated injections was 1, 2, and 3 g. per

DR. BELYAVIN: REFERENCES—*continued*

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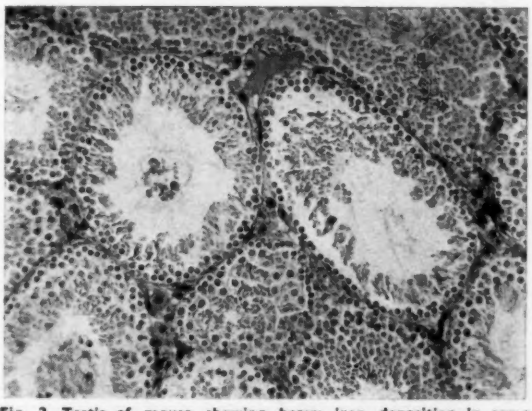

Fig. 2—Testis of mouse showing heavy iron deposition in some interstitial cells and light staining of the rest of the interstitial tissue. Note darkly staining fluid in one of the interstitial-tissue spaces. Mouse received 0·5 g. of iron (as imferon) per kg. of body-weight in a single intravenous injection and was killed a fortnight later. (Prussian-blue and carmalum. × 148.)

kg. of body-weight and the mice were killed up to 10 weeks after the last injection.

Results

All mice receiving repeated doses of imferon showed striking testicular atrophy, whose progress was followed easily by palpation. The severity of atrophy depended on the total dose as well as the duration of siderosis. The weight of testes showing maximal atrophy was 25–30 mg., compared with 90–120 mg. of the controls. Sections revealed increasing degrees of iron deposition in the interstitial cells and correspondingly increasing damage to the seminiferous tubules with striking effect on spermatogenesis (fig. 1). There was in addition an increase of interstitial tissue, presumably as a result of replacement regeneration. Tubule cells showed some iron staining in advanced interstitial siderosis.

Sections taken at intervals after single doses showed iron in the extravascular interstitial histiocytes as early as three hours after the injection, when most of the iron was still in the circulation. The prussian-blue staining revealed in the interstitium spaces (figs. 2–5) containing

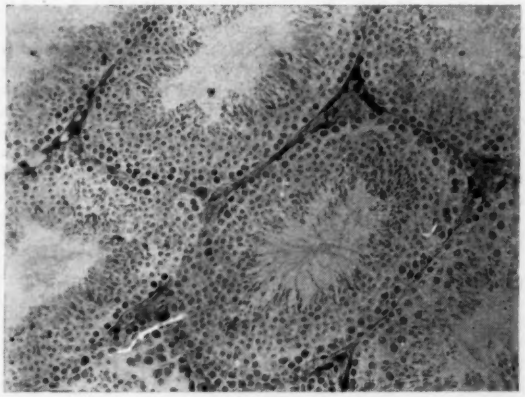

Fig. 3—Testis of mouse showing heavy deposition of iron in some interstitial cells, presumably mainly histiocytes, without staining of the rest of the interstitial tissue. Note interstitial spaces containing fluid stained darkly with prussian-blue. Mouse received 0·5 g. of iron (as imferon) per kg. of body-weight in a single intravenous injection and was killed 4 days later. (Prussian-blue and carmalum. × 148.)

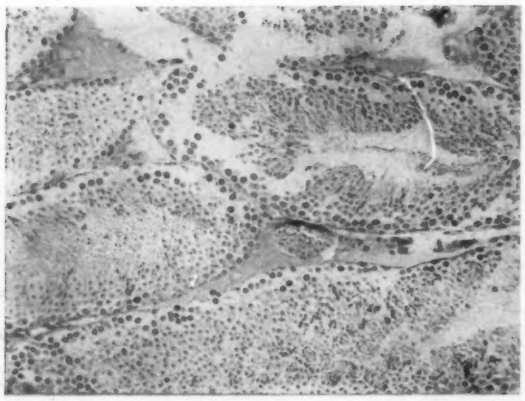

Fig. 4—Testis of mouse showing uptake of iron by few histiocytes in the interstitial tissue, and blue-staining fluid in spaces. In one space fluid surrounds a medium-sized vessel, which contains iron-staining plasma near the upper edge. Mouse received 0·5 g. of iron (as imferon) per kg. of body-weight in a single intravenous injection and was killed 4 hours later. (Prussian-blue and carmalum. × 148.)

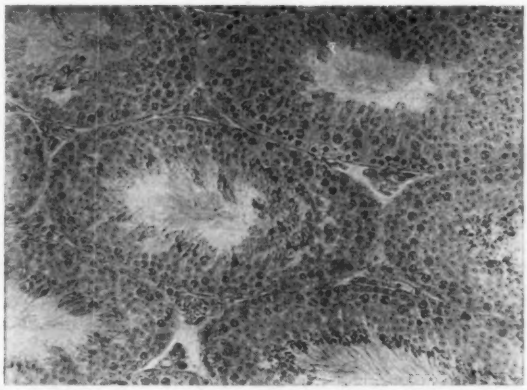

Fig. 5—Testis of mouse showing absence of iron staining from all interstitial cells including histiocytes. Compare normal seminiferous tubules and spermatogenesis with tubules in fig. 1. Animal received 0·5 g. Fe./kg. as saccharated iron oxide intravenously and was killed 4 hours later. (Prussian-blue and carmalum. × 148.)

fluid which bathes islets of interstitial tissue. The staining in this fluid was initially as intense as that in the plasma; but, as the iron disappeared from the vessels, the fluid in the interstitial-tissue spaces continued to show much iron staining. With passage of time the endocrine interstitial cells exhibited increased iron staining, and the number of cells with iron deposition comparable to that of histiocytes also increased. These latter cells may be either proliferating histiocytes or the older endocrine interstitial cells that have become saturated with iron; but, since little histiocyte proliferation takes place in the testes after the administration of other iron preparations, the hypothesis of endocrine origin of these cells seems more likely.

Discussion

Though these experiments do not suggest that a significant amount of iron may accumulate in the interstitial cells of the testes after therapeutic administration of imferon in man, the early appearance of the compound in the histiocytes and fluid spaces of the testes is possible.

In anæmia, however, the iron is probably soon mobilised for the synthesis of hæmoglobin.

Control experiments with saccharated iron oxide showed no iron in the interstitial histiocytes of the testes or in the fluid spaces until a few days after the injection, when some of the iron has been solubilised by the intravascular histiocytes which form the primary site of deposition. Thus, the early appearance of imferon iron in the histiocytes and fluid spaces of the testes suggests a smaller particle size. This was confirmed by the injection of the diffusible iron and ammonium citrate into mice. Owing to greater toxicity the doses given were much smaller, but histiocyte uptake was shown as early as $1^1/_2$ hours after the injection, and the fluid was visible in the interstitial spaces after an immediately lethal dose.

The later stages in imferon siderosis lend themselves to different interpretations, but the continued presence of iron-staining fluid in the interstitial spaces suggests that iron is continually transferred from the histiocytes to the endocrine cells. The progressive increase of the total iron in the interstitial tissue in turn suggests that iron is also continually transported to the testes from other parts of the body. The iron compound apparently interferes with the normal metabolism of the endocrine cells. Whatever the mode of action, the iron complex damages the seminiferous tubules and upsets spermatogenesis. The mode of action is a matter for further investigation.

The deposition of iron in the testes after the administration of imferon reminds one of the deposition of iron in the testes and testicular atrophy in hæmochromatosis. No deposition of iron has been noted, however, in the pituitary gland, the thyroid gland, or the islets of Langerhans after the administration of imferon; therefore the mechanism of the two conditions must differ.

The ovaries of mice did not exhibit unusual affinity for imferon, the deposition of iron in them being similar to that described previously for saccharated iron oxide (Nissim 1952b).

Summary

Massive deposition of iron took place in the interstitial cells of the testes in experimental siderosis of mice with imferon.

This was associated with severe testicular atrophy and degeneration of the seminiferous tubules.

I wish to thank Messrs. Benger for the imferon used in these experiments.

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ACCIDENTAL INOCULATION WITH POLIOMYELITIS VIRUS

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THE development of poliomyelitis in laboratory workers exposed to virus has rarely been recorded. Sabin and Ward (1941) recorded the case of a laboratory associate, aged 35, who contracted paralytic poliomyelitis, probably in the course of her work on cynomolgus monkeys. Two laboratory workers were reported by Beller (1953) to have been accidentally infected in the eyes and nose with Lansing virus while inoculating mice with a virulent mouse-brain suspension; both developed symptoms after fourteen days.

In the following case a technician was infected through accidental abrasion of a finger.

A laboratory technician, aged 22, was admitted to Hospital on Nov. 11, 1954. He had been employed in a research unit, and among his duties was the necropsy of animals dying after inoculation with poliomyelitis virus. On Nov. 1 he was removing the spinal cord from a monkey which had

become paralysed and had died after repeated intramuscular inoculation of a tissue-culture of propagated M.E.F.-1 strain of virus (type 2). The patient sustained a small abrasion of a finger with a bone spicule from the vertebral column; this took three days to heal. He was given gamma-globulin 15 ml. (1·5 g.) intramuscularly on the same day, and was quite well until Nov. 9, when he complained of headache and lumbar pain. The following day he also had pain and tenderness of abdominal muscles.

On admission he had a temperature of 102°F, slight neck stiffness, and a positive Kernig's sign. The neck stiffness cleared up the next day, but the tenderness and spasm of abdominal and hamstring muscles continued for another week. The erythrocyte-sedimentation rate was 1 mm. in the first hour (Westergren). White blood-cells numbered 3300 per c.mm. (70% polymorphs, 21% lymphocytes, 7% monocytes, 2% eosinophils). Lumbar puncture was not carried out on admission, but on Nov. 25 the cerebrospinal fluid contained 250 lymphocytes per c.mm., 70 mg. protein per 100 ml., 720 mg. chloride per 100 ml., and 70 mg. sugar per 100 ml.; culture was sterile. The complement-fixation antibody investigations on serum taken on the third and twenty-eighth days of the illness did not by themselves lend convincing support to a diagnosis of recent systemic infection with poliomyelitis virus.

During the patient's illness there was indefinite weakness of the extensor muscles of the fingers of both hands. His further progress was uneventful, and he was discharged for convalescence on Dec. 12.

Poliomyelitis was not epidemic in the district; and it is reasonable to assume that the patient contracted poliomyelitis by infection through the accidental scratch. The administration of gamma-globulin on the same day as the injury did not prevent the illness from developing after eight days' incubation, though it may have lessened its severity.

I wish to thank Dr. W. Wood for the history of the patient, especially with reference to the administration of gamma-globulin, and Dr. G. L. Le Bouvier, of the Virus Reference Laboratory, Colindale, for the serum complement-fixation antibody investigations.

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Medical Societies

ROYAL SOCIETY OF MEDICINE

Osteoporosis

THE section of medicine met on March 22, with Sir HENRY COHEN, the president, in the chair, to discuss Osteoporosis.

Dr. H. A. SISSONS defined osteoporosis as a condition of bone where the supporting tissue was reduced, but remained highly mineralised; and where sections did not reveal the broad osteoid seams which characterised osteomalacia. Osteoporosis was a non-specific pathological response. In examples of the local osteoporosis of disuse, where thin slabs of bone had been radiographed and then studied histologically, the initial lesions were found to be localised areas of osteoclastic bone destruction; in the chronic stage the changes were more diffuse and the porotic bone showed neither destruction nor formation of bone.

In Cushing's syndrome an excess of adrenocortical hormone produced generalised osteoporosis. The bony trabeculæ were thin and reduced in number; excess osteoclasis was not apparent, but osteoblastic bone formation was diminished. Radiographs of slabs of the vertebral bodies showed that the trabeculæ at first lost their normal orderly arrangement and then broke under the force of compression so that the vertebral bodies collapsed.

Dr. Sissons regarded osteoporosis as an imbalance in the normal process of continuous bone destruction and formation in favour of destruction.

Dr. C. E. DENT discussed diagnosis. He followed Albright's definition—a deficiency of the protein matrix of bone without abnormalities in the mineral elements. The calcium, phosphorus, and phosphatase contents of the blood were normal. He emphasised that the term was not to be used to cover any rarefaction of the bones, which could result from osteomalacia (where the calcification of bone was at fault), from hyperparathyroidism (where there was an abnormal removal of calcium from the skeleton), or from neoplastic diseases of bone. The diagnosis depended first on recognising that rarefaction of the skeleton had taken place. The early changes were purely radiographic, but collapse of vertebræ could be diagnosed by finding a reduction in the distance from the crown to the pubis, which normally equalled that from the pubis to the heels, and in the distance from the crown to the heels, which normally equalled the span. In osteoporosis some vertebræ were more rarefied and distorted than others; in osteomalacia the vertebræ were more evenly affected. The diagnosis of osteoporosis was by exclusion—a dustbin for those rarefactions of bone that could not otherwise be explained. Some cases were indistinguishable from the late form of osteogenesis imperfecta.

Dr. Dent had not had much success with treatment in 4 cases of idiopathic osteoporosis which he had studied in detail, but 1 had responded remarkably to repeated large infusions of plasma.

Dr. PAUL FOURMAN discussed endocrine aspects. The present-day definition of osteoporosis had been followed by several pupils of von Recklinghausen twenty-five years ago. Albright had sought to relate the condition to endocrine factors, and had suggested that the failure of the bone matrix could be the result of a lack of anabolic hormones, the "N" hormone of the adrenal cortex and the gonadal hormones; it could, on the other hand, result from an excess of anti-anabolic hormone, the "S" hormone of the adrenal cortex.

Osteoporosis in old age was probably a manifestation of the normal atrophy of the tissues associated with ageing. It could be, perhaps, related to a failure of adrenal "N" hormone production. Senile osteoporosis was much commoner in women, and when it appeared early it was called postmenopausal; but Dr. Fourman doubted whether it could be attributed to a lack of œstrogens, although œstrogens often relieved the pain. The response to androgens was better still, but it was rare to find that the bones became denser.

Dr. Fourman demonstrated the osteoporosis of Cushing's syndrome and of acromegaly, and mentioned the osteoporosis of diabetes. Thyrotoxicosis did not produce osteoporosis as the speakers had defined it, but it produced an excessive osteoclasis. On the other hand, cretins sometimes had osteoporosis, and he had seen it in a patient with myxœdema. He thought osteoporosis was a non-specific response to various different disturbances in the nutrition of the tissues.

In the discussion, Dr. DONALD HUNTER emphasised that further advance depended on finding ways of measuring the changes. He appealed for the use of the band-saw in the necropsy room. Dr. A. W. SPENCE agreed with Dr. Hunter that in thyrotoxicosis there was excessive bone destruction. He asked whether with methyl androstenediol one might achieve the same benefit as with androgens, without the complication of masculinisation. Dr. B. E. C. NORDIN suggested that the atrophy of the bones in osteoporosis might be in proportion to the atrophy of other protein tissues, and that osteoporosis was but a symptom of disease affecting the whole body. Insufficient attention had been paid to possible changes in the polysaccharides of bone matrix.

Reviews of Books

Pædiatrics for the Practitioner

Vol. I, II, III, and Index. General editors: WILFRID GAISFORD, M.D., M.SC., F.R.C.P., professor of child health and pædiatrics, University of Manchester; REGINALD LIGHTWOOD, M.D., F.R.C.P., D.P.H., director of pædiatric unit, St. Mary's Hospital medical school. London: Butterworth. 1955. Pp. 1849. £13 10*s.* the set.

THIS ambitious work has now been completed by the publication of the third volume, the first having appeared in 1953. It epitomises the increasing emphasis on the promotion of good health in childhood, and is the first major pædiatric textbook to be written specially for general practitioners.

It is comprehensive without being too detailed, and embraces such subjects as growth and development, the care of the newborn and normal child, social medicine, and psychology, as well as general medicine and surgery. There are also chapters on disorders of the skin, eyes, ear, nose, and throat, and teeth. The fifty-two contributors, under the general editorship of Professor Gaisford and Dr. Lightwood, have concentrated on practical aspects, particularly the diagnosis and treatment of the common disorders of infancy and childhood; rare conditions are mentioned briefly to complete the picture. Special attention is given to domiciliary treatment by the general practitioner, because the discovery of more potent drugs is increasing the proportion of illnesses which can be treated successfully at home. This work is to be kept up to date by supplements which should enable the practitioner to keep abreast of changes.

These volumes, well produced and liberally illustrated, should prove of great value to general practitioners in this important and satisfying field of medicine.

Biochemical Determinants of Microbial Diseases

RENÉ J. DUBOS, The Rockefeller Institute for Medical Research. Cambridge, Mass.: Harvard University Press. London: Oxford University Press. 1954. Pp. 152. 28*s.*

THE substance of this book is a series of lectures given in 1953 on the occasion of the award of the Warren triennial prize of the Massachusetts General Hospital. In *The Bacterial Cell* (1945) Dr. Dubos examined some of the problems of infectious disease in relation to the form and habits of the parasites. In this book his inquiry is directed to the part played by the host's internal economy in the prevention or encouragement of damage by the parasites. Together the two works are a distinguished ornament to the "newer bacteriology." The keystone of the argument lies in the sentence "infection is in many cases the normal state; it is only disease which is abnormal." It is the end of the old anthropomorphic view that simplified all infectious processes to a war between an intact body and innumerable hostile invaders.

Although much of the evidence is chemical the outlook is that of a biologist, and indeed some of the matter is drawn from fields outside the experience of most bacteriologists. Dr. Dubos modestly but sternly refuses to make dogmatic generalisations, but throughout there flows a sparkling stream of suggestive hints and theses presented for disputation.

It is a very proper book to put in the hands of him who imagines that all the fields for research are already under cultivation. Others will regret their limitations of time and intellect but be grateful to the author for an exciting experience. The writing is lucid if sometimes inelegant. The make-up is pleasant, but the price lamentably high.

The Histopathology of the Respiratory Tract in Human Influenza

J. F. PH. HERS, M.D. Leiden: H. E. Stenfert Kroese. 1955. Pp. 77. 17.50 Dutch florins.

THIS is an excellent monograph. It records a detailed examination of the epithelium of the respiratory tract in twelve cases of influenza, of which seven were complicated by infection with staphylococci and five with other bacteria. The changes are compared with those found in four cases of fatal infection with *Hæmophilus influenzæ* and pneumococcus unassociated with influenza virus. The coincident focal necrosis and regeneration is typical of, but not confined to, influenza; for the same appearances have been found in measles and varicella. Examining smears of tracheal epithelium is valuable for rapid post-mortem diagnosis; and characteristic cytological changes can be recognised in the sputum during life. The monochrome reproductions of the photomicrographs are good; and the method of placing them at the back of the book is unusual and effective.

A Therapeutic Index

C. M. MILLER, M.D. Lond., M.R.C.P., consultant physician, Sefton General Hospital, Liverpool; B. K. ELLENBOGEN, M.D. Lpool, M.R.C.P., senior medical registrar, Royal Southern Hospital, Liverpool. London: Baillière, Tindall, & Cox. 1955. Pp. 148. 12*s.* 6*d.*

IN this gallant attempt to compress modern therapeutic opinion into the space of a pocket-sized volume Dr. Miller and Dr. Ellenbogen have achieved comprehensiveness without undue sacrifice of detail: no mean feat, for the territory is immense, the byways innumerable, and the main thoroughfares themselves sometimes hard to follow. By describing only the more prominent landmarks (ancient monuments excepted) they have provided the young houseman or practitioner with a sensible and reliable Baedeker. The book is likely to prove most valuable in emergencies, when there is no time to consult the larger textbooks; but it will also be read with profit in moments of leisure, for it contains some useful hints on practical procedures and therapeutic diets.

Il Sistema Istiocitario

PIETRO FRANCESCHINI. Florence: Edizioni Scientifiche Salpietra. 1954. Pp. 883. L. 12,000.

THIS is a Florentine *cimento*, a "bold venture," by an anatomist and surgeon distinguished for his studies on the histiocytic tissue of synovial membrane, the reactivity of the peritoneum, and the histiocytic structure and function of the leptomeninges. Dr. Franceschini is a pupil of Chiarugi and Banti, and his book will interest specialists in many branches of physiology and pathology. The book is a comprehensive account of the reticulo-endothelial system, and a valuable record of much fine, though little-known, Italian research.

The first half deals with general topics, such as the relation of the reticulo-endothelial system to tissue permeability, blood-coagulation, the destruction of erythrocytes, infectious diseases, antibodies, intermediary metabolism, occupational and systemic diseases, and antineoplastic resistance. The second half is specialised, and includes chapters on the reticulo-endothelial system in the fœtus and placenta, skin, bone, synovial membrane, and peritoneum. An appendix describes the part of the microscope in the history of biology. Like many of his medical compatriots, Dr. Franceschini has a historical sense, which he reveals with grace and modesty; with them he also shares a taste for controversy and a passionate concern for precise terminology, exemplified in a whole chapter on the definition of the reticulo-endothelial system. The chapter on Banti's disease will be of wide interest outside Italy. It is a relief to find that we are not the only people who do not know what Banti's disease is; an Italian has concisely defined it as the tormented history of a genial pathogenetic conception.

The book has 270 illustrations and ample subject and author indexes; it is well printed on good paper, and strongly bound.

Studies on Fertility.—This sixth volume of the proceedings of the Society for the Study of Fertility, hitherto published in journal form, includes papers read at the conference held by the society in London last year. The editor is Prof. R. G. Harrison, D.M. (Oxford: Blackwell Scientific Publications. 1954. Pp. 151. 21*s.*).

Fat Metabolism.—The Johns Hopkins Press, Baltimore, has published a symposium on this subject, which was one of a series of conferences sponsored by the M. & R. Laboratories, Columbus, Ohio. The editor is Mr. Victor A. Najjar. It is published in this country by the Oxford University Press. (1955. Pp. 185. 36*s.*)

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THE LANCET

LONDON: SATURDAY, APRIL 2, 1955

Nomenclature and Colon Disorders

STUDY of inflammatory conditions in the colon is bedevilled by the nomenclature, or the lack of it. Because of the naked-eye appearance of the large bowel of patients with chronic non-specific diarrhœa, WILKS and MOXON [1] introduced the term ulcerative colitis. The name having been given, the condition was assumed to be a disease sui generis. Consequently the question is not uncommonly asked: What is the cause of ulcerative colitis?; whereas the causes are probably many. There was BARGEN's bacillus; there is the school of allergy [2 3]; there is evidence that physical [4] and chemical [5 6] agents can precipitate the condition; and long ago SYDENHAM [7] stated: "Sometimes though very rarely, it happens that a dysentery, not rightly cured originally, shall afflict a particular patient for many years"—an observation supported by STEWART,[8] FELSEN and WOLARSKY,[9] and HURST.[10] All these explanations may be right; certainly the histological evidence would support them all, for in the first instance ulcerative colitis appears to affect the mucosa, which like the skin may be subject to many forms of trauma and once severely damaged may remain unhealed.

Confusion has been increased by the response to the need for more titles. When CROHN [11] first described 14 cases of regional ileitis the name seemed to be no problem; but later it was realised that the colon could be involved, with or without a small-bowel lesion, and then the terms "regional enteritis" or "regional colitis" were brought into use. "Regional colitis" can also indicate ulcerative colitis proper; and BARGEN, who is convinced that ulcerative colitis starts in the rectum, has used this term for cases in which that organ is not involved. "Regional (segmental) colitis," he says, "may be defined as an inflammatory disease of unknown etiology involving initially one or more segments of the large intestine, exclusive of rectum and recto-sigmoid, either as a continuous lesion or as multiple discontinuous lesions" [12]—a definition that includes both Crohn's disease and ulcerative colitis. Some may indeed regard with reserve the separation of Crohn's lesion from ulcerative colitis. Yet there are clear differences. To the naked eye they do not resemble each other; for, in contradistinction to the findings in ulcerative colitis, in Crohn's disease the bowel wall is thickened throughout all layers, the bowel tends to adhere to adjacent viscera and to become the site of fistulæ, and the limits of the lesion are well defined except for minute ulcers which are sometimes seen beyond the area of gross change.[13] The histological evidence of WARREN and SOMMERS [6] suggests that morphologically Crohn's disease is quite distinct from ulcerative colitis, while HADFIELD [14] maintains that in Crohn's disease mucosal ulceration is a secondary change not present at the outset. In ulcerative colitis the ileum may be involved as in Crohn's disease; but BROOKE [4 13] has shown that such involvement is incidental to the destruction of the ileocæcal valve by long-standing disease—a finding confirmed by INBERG.[15] Clinically, the complications of arthritis, iritis, and skin lesions are found only in ulcerative colitis. CROHN himself, reflecting on 562 personal cases, still feels justified in classifying the condition named after him as a pathological and clinical entity.[16]

COOKE and BROOKE [17] have now given a fuller account of a condition not unlike ulcerative colitis which they had already mentioned briefly.[18] Steatorrhœa is not a feature of ulcerative colitis even when the terminal ileum is invaded, unless there is associated pancreatitis. COOKE and BROOKE have seen 16 patients with frank steatorrhœa in whom there was radiographic and sigmoidoscopic evidence of colitis. In 2 cases diffuse ulceration of the small bowel was found at necropsy. There was little or no thickening of the wall of the small gut, and indeed there was no evidence of the lesion there until the intestine was opened for inspection; in this respect it differed from Crohn's disease. Ileitis secondary to ulcerative colitis is limited in extent and rarely involves more than a foot of intestine, but in their patients with steatorrhœa the small bowel was involved throughout. In the colon the right side seems to be attacked first; the inflammation then spreads distally. They therefore suggest that the colitis is secondary to the small-bowel disorder. The importance of this unusual condition lies in its close resemblance to ulcerative colitis—particularly that subgroup previously called right-sided colitis which, COOKE and BROOKE suggest, may be the same disease. The usual surgical treatment of ulcerative colitis proper may bring disaster in such cases; they argue that deaths from ileitis after ileostomy have included cases in which this condition was mistaken for ulcerative colitis and the small-bowel lesions passed unnoticed. Meanwhile yet another name has been added to the terminology; for what was at first called ileocolitis [18] COOKE and BROOKE now use the term non-specific enterocolitis. Ileitis secondary to ulcerative colitis could perhaps be suitably termed colo-ileitis, thus reserving ileocolitis or enterocolitis for conditions in which the small intestine is known to be affected primarily and the disease usually spreads distally.

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Diuresis from Carbonic Anhydrase Inhibition

THE side-effects of the early sulphanilamides included a metabolic hyperchloræmic acidosis [1] associated with alkaline urine [2] and increased urinary excretion of sodium and potassium.[3 4] Later MANN and KEILIN [5] showed that sulphanilamide and its amino-substituted derivatives inhibited specifically the enzyme carbonic anhydrase, which was demonstrated in the renal cortex.[6] HOBER [7] linked these various observations by adding sulphonamides to fluid perfusing frog kidneys and showing that the normally acid urine was rendered alkaline by derivatives capable of inhibiting carbonic anhydrase. PITTS and ALEXANDER [8] proved conclusively that acidification of urine depended on the active secretion of hydrogen ions into the tubular urine by cells of the renal tubules. Sulphanilamide given to acidotic dogs both alkalinised the urine and increased excretion of bicarbonate-bound base. These studies, and their subsequent extension by PITTS [9 10] and BERLINER et al. [11 12] have provided considerable insight into renal tubular mechanisms concerned with conservation of base. It is now believed that one of the most important mechanisms by which Na^+ is reabsorbed from the glomerular filtrate is by exchange with H^+ and K^+ secreted into the lumen by tubule cells; whether the cation exchange of Na^+ is predominantly with H^+ or K^+ is apparently determined by the relative availability of these two ions within the tubular cells.[13] Availability of renal-cell H^+ is determined by carbonic anhydrase through the following reaction sequence:

$$H_2O + CO_2 \underset{\text{anhydrase}}{\overset{\text{carbonic}}{\rightleftharpoons}} H_2CO_3 \rightleftharpoons HCO_3^- + (H^+)$$

H^+ → secretory exchange with Na^+

Nothing is known of the biochemical mechanisms involved in the H^+/Na^+ cation exchange; but when available H^+ is reduced by carbonic-anhydrase inhibition or by reduction of CO_2 tension,[14] the over-all tubular reabsorption of Na^+ is reduced and sodium excretion increases. Obviously, one way of promoting the renal excretion of sodium would be by deliberate inhibition of carbonic anhydrase.

The possible therapeutic value of the diuretic action of sulphanilamide was recognised by SCHWARTZ,[15] who administered the drug to patients with congestive cardiac failure and recorded increased urinary output of sodium and potassium, together with significant loss of weight. But, though the results were promising, the drug was too toxic in the large doses that were needed. Since 1950 a relatively non-toxic heterocyclic sulphonamide, acetazoleamide (2-acetylamino-1,3,4-thiadiazole-5-sulphonamide, compound '6063' or 'Diamox') has been intensively investigated.[16–26] Acetazoleamide is a highly potent reversible inhibitor of carbonic anhydrase which can be given by mouth.[23] It is absorbed rapidly and is stable in the body; it is excreted relatively slowly by the kidneys, and more than 70% of the administered dose is recovered in the urine within twenty-four hours.[23] After a single dose of 250 mg. the rate of excretion of sodium, potassium, bicarbonate, and water increases; the urine becomes alkaline; and excretion of ammonia and titratable acid is reduced.[18 21 23 25] Which cation is principally excreted with bicarbonate depends partly on previous dietary intake; in potassium deficiency sodium-bicarbonate excretion is favoured,[13] and in sodium depletion potassium-bicarbonate excretion.[21] Toxic effects are uncommon and and slight.[23] Drowsiness, or even quite deep sleep, has been experienced by some patients in most large series studied [16 17 19 26]; and apparently harmless paræsthesiæ, in the form of tingling or numbness in hands and feet or about the mouth, are not uncommon.[16 17 22 26] More serious cerebral symptoms, such as toxic psychosis, are exceptional.[23] Together with the other toxic symptoms, they suggest a direct action of the drug on the nervous system; they are reminiscent of the occasional toxic psychosis and polyneuritis produced by the parent sulphanilamide. The drowsiness and paræsthesiæ subside after withdrawal of the drug. No peripheral motor symptoms have been recorded. Only one case of agranulocytosis has been recorded; the patient recovered.[27]

It is thus evident that acetazoleamide has theoretical pharmacological qualifications as an oral diuretic. All workers agree that a single dose in healthy people or œdematous patients will produce the diuretic effects already described; the maximal rate and total amount of bicarbonate excretion after a single dose show the usual logarithmic relation to dosage both in man [21] and in the dog.[23 25] But most workers also agree that the drug becomes ineffective on repeated administration, owing to the development of hyperchloræmic acidosis.[16 18 25 26] The diuretic effect is determined by the amount of bicarbonate filtered by the renal glomeruli,[21 28] and either a reduction in plasma-bicarbonate level or the reduction in glomerular filtration-rate that accompanies cardiac failure will reduce the diuretic response. Since the drug produces hyperchloræmic acidosis it is self-inhibitory; and, in balance experiments, continued administration produces no increase in sodium excretion after the first day, although a slight sustained negative potassium balance may result.[18 21 25] At

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first sight, therefore, the theoretical pharmacological qualifications are not borne out by clinical trial; but, as often happens, clinical use introduces variables not anticipated in the controlled experiment, and published clinical reports neither entirely support the pessimistic conclusions of the clinical investigator nor agree with each other. Consequently it is not yet possible to assess the drug as a diuretic, or to suggest suitable dosage. Opinion on diuretic effectiveness varies from virtual nihilism [21] to considerable enthusiasm [18 17 22]; and dosage has ranged from a single tablet of 250 mg., with at least a day between doses, to the continued administration of up to 6 g. a day.[22]

Amid this uncertainty a few points stand out clearly. With moderate continued dosage (up to 2 g. a day in divided doses) no impressive diuretic response may be obtained in congestive cardiac failure due to hypertension or valvular disease [19 21]; but in "resistant" cases the drug may none the less alkalinise the urine and promote the excretion of large amounts of potassium.[18 21] This potential hazard should be borne in mind; and although potassium deficiency from this cause has not yet been recorded in man, it has been produced experimentally in the dog.[23 25] Patients previously resistant to mercurial diuretics may regain responsiveness when a relatively ineffective course of acetazoleamide has produced hyperchloræmic acidosis.[19] Better therapeutic results seem to be obtained with moderate dosage in patients with congestive cardiac failure due to cor pulmonale [20 26]; a significant clinical diuretic response may ensue in about a half of such patients.[20] This better response is understandable if diuresis is determined by the load of bicarbonate filtered by the glomeruli. The high plasma-bicarbonate level in respiratory acidosis is determined by the high carbon-dioxide tension in the renal parenchyma [29]; consequently, it may be found that larger doses of acetazoleamide are needed to inhibit renal carbonic anhydrase in cor pulmonale. The urine reaction and the rates of excretion of ammonia and titratable acid return to normal during continued acetazoleamide treatment [8 21 23 25]; and so, although there is continued systemic acidosis, there are no secondary effects on calcium and phosphorus metabolism such as occur with the hyperchloræmic acidosis of renal tubular acidosis.[23]

When acetazoleamide leads to a successful diuretic response in cor pulmonale [20] or in other types of congestive failure,[22] with weight loss and disappearance of œdema, it has obviously set off the renal excretion of chloride in addition to bicarbonate. Nothing in the experimental investigations of the drug lead one to expect this effect, and there is need for careful documentation of the pattern of urinary excretion during the development of such responses. Other aspects of chloride metabolism during acetazoleamide therapy warrant further investigation. The hyperchloræmic acidosis of continued drug administration develops without change in external chloride balance,[18 21 25] and it is usually ascribed to contraction of extracellular-fluid volume after the renal loss of sodium bicarbonate; yet the findings of LEAF et al.[18] suggest that a similar acidosis may ensue in patients showing diuresis only of potassium bicarbonate. This explanation of the development of hyperchloræmia, and the identical explanation offered for the hyperchloræmia of renal tubular acidosis,[30] seem a little too facile. It used to be thought that the hypochloræmia of potassium deficiency was the outcome of a negative chloride balance; we now know that this change may be associated with an actual chloride retention,[31] and during development of potassium deficiency chloride may be transferred into the inulin space from some other source of body chloride.[32] Is it possible that shifts of body chloride take place during acetazoleamide therapy? Why should hyperchloræmia persist during therapy once the urine pH and excretion of ammonia and titratable acid have returned to normal? What renal change conditions this tolerance of a high plasma-chloride level? These questions are far from purely academic; for we cannot hope to dispose of massive œdema unless we promote the excretion of chloride in addition to that of sodium.

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Annotations

EFFECTS OF EXPOSURE TO NUCLEAR RADIATION

ON March 1, 1954, a "very large thermonuclear device" was exploded at Bikini, an atoll in the western Pacific. The resultant cloud of radioactive material drifted down wind and eventually settled over a cigar-shaped area some 220 miles long and up to 40 miles wide. Instruments had been placed at intervals over the predicted area of fall-out, enabling the American scientists to measure the intensity of the radiation at different points, and to calculate the number of casualties there would have been had the area been populated. They estimated that up to 140 miles down wind from the explosion the radioactivity would have sufficed to threaten the lives of all unprotected persons who failed to take any precautions whatsoever; 160 miles down wind, about half the number of unprotected persons might have survived; while 220 miles or more down wind, even those exposed to the radioactivity for as long as forty-eight hours would have stood a good chance of survival.[33] In actual warfare, the number of casualties could be much reduced by taking immediate cover, and also by prompt decontamination: even such simple measures as thoroughly bathing the exposed parts, changing the clothing, and avoiding the ingestion of contaminated food may often save life. Nevertheless, the predictions gave some idea of what a single large bomb might do—at least to an unprepared and uninformed population.

As everyone now knows, partial confirmation of the scientists' calculations was not long in coming. On the day of the test a Japanese fishing vessel, the *Fukuryu-Maru*, had been operating within 100 miles of the explosion. The crew of 23 saw the flash, and observed a column of white cloud rising rapidly into the sky. About three hours later, a white powdery ash began to fall on the boat, and it continued to fall for several hours. After a few days, the fishermen noticed that those parts of their skin which had been touched by the ash had become dark red and swollen; and on their return to port a fortnight later the entire crew was found to be suffering from radiation sickness. They were admitted to hospital, where their progress was studied by members of the clinical division of the Japanese Research Council of Radiation Sickness.

33. United States Atomic Energy Commission. The Effects of High-Yield Nuclear Explosions. Feb. 15, 1955.

The initial symptoms were the same as those which had been observed among casualties at Nagasaki and Hiroshima. Some of the men began to have headache, vomiting, and diarrhœa within a few hours of their exposure to the ash, and in many of them depilation started before their return to port. In the first month, exhaustion and anorexia were prominent symptoms; some developed fever of up to 102°F, and others showed a mild hæmorrhagic tendency. Radiation dermatitis was present in almost every case. Blood-examinations in all cases revealed greater or lesser degrees of leucopenia, erythropenia, and thrombopenia, and an increase in the coagulation-time; in 5 of the men, the leucocyte-count fell within the first month to 1000 per c.mm. In August one of the men developed jaundice, and he died on Sept. 23. Extensive studies on the spermatozoa of the other 22 men showed in all cases a gradual reduction in the spermatozoa-count, a diminution in the motility, and an increase in the proportion of deformed spermatozoa. By last December (nine months after the Bikini test) the spermatozoa-count had in every case fallen to zero.

No aspect of nuclear radiation is at present causing more concern than the harm it may do to future generations. Clearly, the effect of exposure to doses of any magnitude is to produce a serious disturbance of spermatogenesis, possibly leading to sterility which, though not permanent, may last more than two years (as in some of the Hiroshima and Nagasaki victims). But the real hazard is of course far more serious. Radioactivity of all kinds has been found to cause an increase in the mutation-rate in all animals and plants in which it has been tested; and, since most mutations of genes are harmful, the result of irradiation is that after several generations the incidence of abnormalities is raised. Geneticists are still uncertain of the threshold-level of irradiation below which the mutation-rate is not increased; and conceivably this may be only a little higher than that produced naturally by existing radioactive material in the soil, water, and air. What is known, however, is that as a result of the 60-odd nuclear detonations to date, the total radiation received by the world's population has measurably increased [33]; and each future explosion will raise the total still further. The exposure of each American citizen has been calculated as having increased by an amount equivalent to that received during one chest radiograph (0·1r) [33]; in this country, it is said, the corresponding figure would be about a third of this.[34] The point at issue, however, is not what radiation is being received by the chest but what radiation is being received by the gonads. The doses in question are, of course, far lower than those which radiologists working with radioactive materials consider dangerous, but it has already been argued that, since vast numbers of the world's population are at risk, the possibility that the genes of some individuals have already been damaged cannot wholly be ruled out. Opinion differs widely: and Mr. Iain Macleod, speaking for the Government, stated last week that the increase in radioactivity to date is most unlikely to have had any appreciable genetic effect. But the fact that the recent white-paper on defence did not even refer to the subject does not suggest any great eagerness on the part of the Government to supply discouraging information.

Clearly the evidence is far from complete, as regards both the effect of radiation on the present generation, and the possible effects on generations in the future. But, whether or not the test explosions have yet done any permanent harm to the human race, it seems likely that their continuance will eventually do so; for Prof. Joseph Rotblat [35] calculates that explosion of hydrogen bombs at the modest rate of $2^1/_2$ per annum would in thirty years double the natural level of radiation. As for full-scale warfare with these weapons, he says that "it is no longer a question of two nations, or groups of nations, devastating each other, but of all the future generations of all nations who will for ever pay, through disease, malformation, and mental disability for our folly."

34. See *Times*, March 23, 1955.
35. Rotblat, J. *Atomic Scientists' Journal*, March, 1955. See *Manchester Guardian*, March 24

ELECTROCARDIOGRAPHIC CHANGES IN INFARCTION

THE electrocardiographic diagnosis of infarction still depends on recognition of abnormal patterns in the twelve conventional leads. Attempts by vector analysis to integrate the deflections of body-surface leads into a single expression of the electrical forces of the heart have proved informative, but this method is too complicated for clinical practice. Grant and Murray [1] have proposed a method by which the surface of the chest is divided into areas of positivity and negativity, and a simple correlation is established between the cardiac vector and the deflections of the electrocardiogram. The deflections of precordial leads can be compared with those produced at the surface of a cylinder by an electrical dipole at its centre, and will be at zero when the axis of the lead is perpendicular to the cardiac vector. By plotting a number of zero points for different instants of QRS (0·01 sec., 0·02–0·04 sec.) Grant and Murray constructed "a null contour" on the chest of healthy people, with a positive area anteriorly and to the left and an extensive negative or "Q" area to the right and posteriorly.

They found that the essential feature of infarction in conventional electrocardiograms was the encroachment of the Q area for the first 0·04 sec. of QRS on to the left and anterior part of the chest. From an admittedly small number of cases they concluded that the mean 0·04 sec. vector was abnormal when it was directed 45° away from and posterior to the mean QRS vector; or, in anatomical terms, when it was directed away from the left ventricle instead of from the mitral/aortic orifice. Comparing the electrocardiograms of 180 cases, Grant and Murray determined the "infaret vector" by subtracting the post-infarction from the pre-infarction vector, and found that it was directed away from the damaged part of the electrical field deforming the first 0·04 sec. of the QRS complex in almost every case. They located the electrical defect in the heart by this method and found fairly close agreement with the conventional anatomical localisation. Divergencies with diaphragmatic and anterolateral lesions were probably due to the direction of the pre-infarction vector. Two types of alteration of the terminal 0·02 sec. vector of QRS were found—one in a direction opposite to that of the initial vector, and the other in the same direction. There was evidence suggesting that peri-infarction block without QRS prolongation was responsible for the former, and complete transmural electrical defect for the latter. The field defect in all these cases of infarction was on either the anterior or the diaphragmatic surfaces of the left ventricle and was distributed along the line of the interventricular septum.

Grant and Murray insist that the electrocardiogram records electrical rather than anatomical localisation of myocardial damage, and that the agreement with empirical anatomical localisation is incidental. The fact that even with multiple infarction there is only one Q area proves, they think, that each lead records the sum of all the electrical forces at its particular point on the body's surface rather than the potentials of the underlying myocardium. Prinzmetal and his associates,[2] on the other hand, strongly support Wilson's "window" concept of the QS waves in infarction; in dogs with infarction produced by coronary-artery ligation, they recorded identical QS waves from epicardial, intramural, and cavity leads over areas of completely functionless muscle. But that this is not the only explanation of the QS complex was suggested by the rather unexpected finding of similar cardiograms, differing chiefly in depth

1. Grant, R. P., Murray, R. H. *Amer. J. Med.* 1954, **17**, 587.
2. Prinzmetal, M., Kennamer, R., Maxwell, M. *Ibid*, pp. 610, 614.

and steepness of the QS wave, from infarcts where there was both clinical and histological evidence of some muscle activity. Seeking another explanation, Prinzmetal and his associates recorded direct electrocardiograms from parts of the ventricle which had been progressively damaged by burning or excision. When only subepicardial muscle was damaged R waves were still recorded, but when the outer third of the ventricular wall or the deeper areas were involved R waves were replaced by QS waves. These observations suggested that the subendocardial muscle, probably because of its rapid depolarisation, contributes nothing to the R wave in an epicardial lead, and that QS leads can be produced by subepicardial as well as by transmural infarction. Prinzmetal and also Grant and Murray confirm the practical diagnostic importance of QS waves and Q waves of 0·04 sec. as signs of infarction, but seem to contradict each other on the theoretical aspect. The difference may be explained by the use of direct leads by Prinzmetal and of body-surface leads by Grant and Murray. This work helps to explain some of the limitations of cardiographic diagnosis.

THE GREAT SCHISM

FOR some years microbiological circles have been stirred by a debate, on the function of the bacterial flagellum, between Prof. A. Pijper on the one side and almost all the world on the other.[1] This heretic believes that, far from being the organ of locomotion, the flagellum is a trailing appendage of an automotive cell; and his evidence is formidable. Oddly enough, throughout the argument little attention has been paid to the detailed structure of flagella, apart from some pictures from the electron microscope which are more elegant that informative. Now Leifson and his colleagues[2] have shown that in stained preparations the flagella of proteus have in the main two distinct and well-defined shapes. What they call "normal" is an open spiral (or zigzag) of two to three waves: "curly" is a tighter spiral (or zigzag) of four to six waves. The two may be found on different flagella of the same bacterium, and there are two rarer types. Which type is seen is influenced to some extent by the environment in which the bacterium has grown. The wave-lengths of each type of curve are remarkably constant for the same species of bacterium. Almost simultaneously Pijper[3] has published a note on the same subject, based, as always, on observation of the living bacillus illuminated on the dark field by sunlight. He confirms his original statement that as a general rule the bacterium advances by a spiral movement of its body with the flagellum sticking straight out behind, like an otter's rudder. (In the photographs this always seems a bit fuzzy.) Under circumstances which he has not yet defined, this straight tail shortens and assumes a spiral shape which may have one of two wave-lengths, one twice as long as the other. Initially the change is reversible, but in the end the organ always finishes as a helix or splits into fine helicules. These may whirl about for a short time and thereby give some erratic movement to the bacterium (quite distinct in Pijper's view from true motility), but their development is associated with stiffening of the body and final immobility.

A cautious view suggests that these two reports describe the same phenomena modified by differences in method. If the development of Pijper's helicules is always associated with death, or at any rate immobility, it is not surprising that they should be the structures seen in stained preparations. He says that they may appear to move to any part of the cell wall, which would explain the lophotrichous and peritrichous arrangements so loved by the systematists. What he does not mention is whether these helicules retain the wave-length of the helix from which they derive. Leifson has carefully measured the wave-lengths of his two forms of curve, but does not call attention to what is clear from his figures—that the wave-length of "normal" curves is always about twice that of "curly." In comparing results obtained by methods so different it would be unfair to ask for complete agreement, but it is a fair guess that Leifson's flagella are Pijper's helicules. Is the fuzziness of Pijper's rod-like flagellum due to its being made up of a sheaf of flagellella? And is this the beginning of the end of the great schism?

1. See *Lancet*, 1946, ii, 871; *Ibid*, 1948, ii, 860; *Ibid*, 1949, i, 1013; *Ibid*, 1952, i, 88.
2. Leifson, E., Carhart, S. R., Fulton, McD. *J. Bact.* 1955, **69**, 73.
3. Pijper, A. *Nature, Lond.* 1955, **175**, 214.

THE EVIL SPIRITS

MANY distinguished bacteriologists and immunologists have talked optimistically of the problem of infectious diseases as virtually solved; and in his presidential address to the American Association of Immunologists,[1] Dr. T. P. Magill has taken these people to task.

Like Dubos, whose latest book is reviewed on p.704, he draws attention to our anthropomorphic attitude of mind. He points out that the peaceful bacterium, trying to find food and shelter in man, is termed an aggressor, whereas it is just as reasonable to call man the aggressor; and that many of the manifestations of disease arise only when man tries to exorcise these supposedly evil spirits. This viewpoint has virtues, not the least of which is its recognition that the aim of preventive medicine should be less to eliminate an infection than to attempt to come to terms with it. Attempts at elimination may have been less strikingly successful than the decline in mortality-rates suggests. It is galling to have to admit that the rates for tuberculosis, diphtheria, measles, and pneumonia began to fall long before modern preventive measures could have taken effect. A factor that is often neglected in calculations on trends of an infectious disease is its natural history or ecology. There are many examples of diseases which have ravaged populations until in the course of time they have lost their malignant character. Such a change may be due to any of several causes. Huge numbers of susceptible people may have died, leaving a resistant core; and in the microbial population it is the less virulent organisms whose survival is favoured, since the organisms which kill their host have entered a blind alley. The recent myxomatosis epizootics in Australia and in this country have shown such processes. There are likewise examples of diseases regaining their former severity.

Magill's lecture will have failed in its purpose if it encourages any ideas of nihilism: public-health measures, immunisation, and antitoxin therapy are indispensable. The lesson to be learnt is that infectious diseases are far from conquered and that present methods of controlling them are far from perfect. In our pride at how much knowledge of bacteriology and immunology has been gained, we must beware of becoming too complacent about the evil spirits.

FOOD-POISONING

THE Public Health Laboratory Service has published another of its valuable annual reports on food-poisoning in England and Wales. This report, on the year 1953,[2] contains an immense amount of data, much of which is given in tables; and it lacks the dramatic impact of the same facts described in narrative form. In 1953 there were 5277 incidents—an increase of 1758 over the previous year. These incidents consisted of outbreaks, family outbreaks, and sporadic cases. The increase is reflected in all the causes listed—namely staphylococci, *Clostridium welchii*, undiscovered, and particularly salmonella. Better reporting must be taken into account, but by the most optimistic estimate there has been no decrease in food-poisoning. The authors of this report believe that at least 4000 cases were not notified—which is a very high proportion.

As in previous years meat dishes, particularly processed or made-up meat dishes, were the most important vehicle;

1. Magill, T. P. *J. Immunol.* 1955, **74**, 1.
2. *Mon. Bull. Min Hlth Lab. Serv.* 1955, **14**, 34.

but ham and boiled bacon were particularly important as vehicles of staphylococcal food-poisoning. Milk caused 12 outbreaks, of which 7 were associated with fresh milk, 4 with dried milk, and 1 with canned milk. 3 of the fresh-milk outbreaks were caused by *Salmonella typhimurium*; 1 of these was due to infection of pasteurised milk during bottling, and another to unpasteurised tuberculin-tested milk. 2 of the fresh-milk outbreaks were due to *Staphylococcus aureus*, originating from infected cows. Several outbreaks were associated with sweetmeats; and one of these, known to have affected two people, was associated with vanilla slices: "*S. enteritidis var. danysz* was isolated from the patients and from mice in the bakery concerned. The bakery had been baited with *S. enteritidis var. danysz* to clear it of vermin a month earlier."

The types of salmonella followed the same pattern as in previous years. About 76% of cases were due to *S. typhimurium* (aertrycke) with *S. thompson*, *S. enteritidis var. jena*, and *S. bovis morbificans* next in order but accounting for only 7% of cases; the forty-six exogenous types accounted for 9% of cases. *Cl. welchii* food-poisoning was associated with meat dishes in every instance, except possibly 1 where the vehicle was not recorded.

Fifty-one deaths were recorded. This report shows that food-poisoning gives rise to a considerable amount of sickness with consequential loss of working-time. Much of this could be avoided by the education and coöperation of the food-handler. We hope that the new Food Hygiene Advisory Council will accept as one of its first duties the education of the housewife, shopkeeper, restaurateur, and other food-handlers.

CHIARI'S SYNDROME

THE clinical picture that results from occlusion of the hepatic veins is generally called after Chiari, who gave the first clear account of its pathogenesis [1]; the disorder had first been reported by Lambron [2] some fifty years earlier. From the number of published cases—115 by 1952—this syndrome might seem very rare; but this figure may be misleading, for Palmer [3] has reported 7 cases verified by necropsy and 4 presumptive cases all seen within a period of thirty-two months. These cases were found at a large tumour clinic: one of the commonest causes of the syndrome is encroachment by metastatic tumours on the hepatic veins; but since this is a late complication of malignant neoplastic disease it probably develops usually after the patient's discharge from hospital.

The clinical features of the syndrome depend largely on the rate at which the hepatic veins are occluded. In acute cases nausea, vomiting, and severe pain in the right hypochondrium due to rapid enlargement of the liver as a result of congestion may be quickly followed by death from hypotensive shock. Less acute cases are characterised by severe and rapidly accumulating ascites and signs of portal hypertension with a developing collateral circulation. Signs of hepatic failure are usually pronounced, and death results from hepatic coma. Simultaneously developing œdema of the legs indicates involvement of the inferior vena cava in the occlusive process. Chronic cases closely resemble hepatic cirrhosis, which may indeed develop as a result of the chronic liver injury due to the greatly impaired intrahepatic circulation. Function tests invariably indicate severe parenchymal damage: bromsulphalein excretion is much reduced, the serum albumin-globulin ratio is reversed, and the flocculation test is almost invariably positive. Patients rarely survive complete occlusion for more than a few months. Ruptured œsophageal varices, portal or mesenteric thrombosis, or intercurrent infection lead to death in the few who do not die of hepatic coma.

Neoplastic involvement of the hepatic veins probably accounts for the majority of cases of Chiari's syndrome, but occlusion of these veins or their ostia undoubtedly arises as a complication of many other conditions. Palmer usefully classifies these under the following headings: congenital, mechanical, hæmatological, diffuse and local liver disease, acquired vascular disease, and disease of neighbouring organs. He lists some 42 conditions as likely to be responsible for hepatic venous occlusion, of which 27 are known each to have accounted for one or more instances. In patients severely ill with, for example, leukæmia, cirrhosis, or local suppuration in chest or abdomen the syndrome may easily be overlooked, and even at necropsy the thrombosed hepatic veins are easily missed if not specifically sought; and this may explain why published cases are so few.

1. Chiari, H. *Beitr. Path. Anat.* 1899, **26**, 1.
2. Cited by Budd, G. *In* Diseases of the Liver. Philadelphia, 1946.
3. Palmer, E. D. *Ann. intern. Med.* 1954, **41**, 266.

STRESS FACTOR IN THE DISC SYNDROME

WE may be on the threshold of important discoveries relating to the physiology and pathology of the intervertebral disc. There is now evidence that the intervertebral disc is a hydraulic unit with a mechanism generating an internal tension suited to the load imposed on it. The nucleus pulposus, exposed to isotonic saline, can generate considerable pressures (100–200 mm. Hg) when resistance is offered to its swelling; and it is conceivable that an acute attack of lumbago might be due to disturbance of the mechanism controlling the access of fluid to the nucleus pulposus, with resulting tension—a possible parallel with the mechanism of acute glaucoma. These speculations suggest possible explanations of the lumbago which follows exposure to cold and wet where there is no evidence of trauma.

Scott [1] has described experimental evidence that swelling of the nucleus pulposus can be produced under the conditions of the "stress reaction" or "general adaptation syndrome." [2] The work reported by Scott was done on voles by D. H. Chitty, who exposed animals to strangers for about two hours a day for three or four days and then compared the size of the nucleus pulposus of each disc with that in control animals. Statistical analysis showed that the difference between experimental and control animals was highly significant. In support of the thesis that raised disc tension may be the basis of acute lumbago in man, Scott reproduces radiographs showing excessive hollowing of the opposing surfaces of vertebral bodies which enclose discs of rather more spherical shape than is commonly seen. But many surgeons will regard this as a normal variation, commonly present without acute back pain; and in any case one would suppose it impossible for a vertebral body to adapt itself to a swollen disc in the three or four weeks during which the raised pressures of the acute tension episode are presumed to be present.

We must here distinguish the difference in psychological states between patients with acute disc episodes and patients with chronic low-back pain. Commonly, women who are depressed and unhappy subconsciously allow themselves to be disabled by pain of a degree which other women tolerate more or less easily. Those who tolerate their discomfort do not tend to consult doctors; in other words, patients coming to hospital because of chronic backache are a self-selected group. On the other hand, in the case of really violent episodes of acute disc pain almost every patient seeks medical advice. The experimental evidence of a "stress factor" relates essentially to acute disc episodes; but, though most surgeons would agree on the association of chronic backache with psychological disturbances, many will deny that this association is common in cases of acute disc lesions.

1. Scott, J. C. *J. Bone Jt Surg.* 1955, **37B**, 107.
2. Selye, H. The Physiology and Pathology of Exposure to Stress. Montreal, 1950.

Special Articles

MEDICAL ADVISORY MACHINERY OF REGIONAL HOSPITAL BOARDS

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"I believe that a medical service cannot be effectively planned unless its organisation includes a comprehensive and representative medical committee at regional hospital board level. This lack is one of the major defects of the present system." [1]

THESE words of the president of the Royal College of Physicians and the description of the effective machinery devised by the Liverpool Regional Hospital Board,[2] suggested that a survey of the methods used in other regions might be of interest.

Of the 14 regional hospital boards in England and Wales, 10 have a committee which, whatever its title, corresponds in function to a medical advisory committee. The constitution of these committees, their method of election, and their method of reporting, are set out in the accompanying table. The organisation employed in the four other regions is as follows:

Sheffield.—The medical members of the board sit as the medical committee of the board. Specialist advisory committees report to the board's medical committee. Area consultant committees are consulted by, and may advise, the board.

Birmingham.—A regional advisory committee, composed of the chairmen of the group medical committees, sits to advise the senior administrative medical officer (S.A.M.O.). In addition there are advisory committees in each specialty.

East Anglia.—In each specialty there is an advisory committee to the S.A.M.O.

North East Metropolitan.—22 advisory committees in the various specialties report through the S.A.M.O. to the board. Matters of general policy are referred where necessary to the advisory committee in general medicine.

Thus the constitution of the medical advisory committees varies greatly; but most of the S.A.M.O.s express themselves as satisfied with their own organisation. Although there are considerable geographical differences between the regions, the methods of taking medical advice do not always seem to be the result of adaptation to environment. There has, however, been at least one instance of evolutionary change; in the South East Metropolitan region the medical advisory committee originally consisted only of the medical members of the board, but it was later enlarged to make it more representative.

In some regions the medical advisory machinery does not approximate to the ideal stated by Sir Russell Brain, and it does not always represent the clinical strength of the regional hospitals or of the medical schools. Even where a medical advisory committee is in being, it may not always be effective. Sometimes its membership is too large, and sometimes so small that it is unrepresenta-

1. Brain, W. R. *Lancet*, 1954, i, 1293.
2. Lloyd Hughes, T. *Ibid*, 1954, ii, 647.

REGIONAL HOSPITAL BOARDS WITH MEDICAL ADVISORY COUNCILS

R.H.B.	No. of members	Including medical members R.H.B.	Description of other members	Method of appointment	Method of reporting	Frequency of meetings	Specialist advisory committees
Newcastle ..	15	Yes	Gen. practitioners (2) M.O.H. (1) Consultants (4)	Appointment after appropriate consultations	Planning committee R.H.B.	Fortnightly	Yes, panels of specialist advisers
Liverpool ..	23	Yes	University (3) Boards of governors (3) M.O.H. (1) Regional consultants (6) Coöpted (1) G.P. (1)	Nomination by appropriate bodies	Planning committee R.H.B.	Monthly	Yes
Leeds ..	11	Yes	Coöpted members (4)	Coöption	General purposes committee R.H.B.	Monthly	Yes, panels of specialist advisers
Manchester .	26	Yes	Gen. practitioners (2) Regional consultants (6) Regional advisers and coöpted members (8)	Appointment after appropriate consultations	R.H.B.	Two-monthly	Yes
Oxford ..	14	Not ex officio	University (2) Boards of governors (4) R.H.B. (8)	Appointment by the 3 bodies without consultation	General purposes committee R.H.B.	Quarterly	Yes
South-Western	16	Not ex officio	Roy. Coll. Physicians (4) Gen. practitioners (3) Roy. Coll. Surgeons (4) Dentistry (1) Roy. Coll. Obst. & Gyn. (1) Coöpted (1 or 2) M.O.H. (2)	Nomination by outside professional bodies	R.H.B.	Two-monthly	Yes, and area committees
Welsh ..	39	Not ex officio	H.M.C. medical committees (15) Mental health (1) Dentistry (1) Consultant advisers (16) Liverpool University (5) M.O.H. (1)	Nomination	R.H.B.	Biennially	Yes
North West Metropolitan	21	Yes	Regional consultants (6) Gen. practitioners (2) Regl postgrad. adviser (1)	Selection and nomination Nomination	R.H.B.	Monthly	Yes
South East Metropolitan	17	Yes	Gen. practitioner (1) Regional consultants (2) M.O.H. (1) Teaching hospitals (4) Regl postgrad. adviser (1)	Nomination and selection Nomination	R.H.B.	Monthly or two-monthly	Yes
South West Metropolitan*	17	Yes and chn and vice-chn R.H.B.	Regional consultants (4) Medical schools (3) Regl postgrad. adviser (1)	Nomination and selection	R.H.B.	Two-monthly	Yes

* The Western Area of the region has its own medical advisory committee.

tive of either areas or specialties. Occasionally it includes the chairman and vice-chairman of the regional board, which shows that its essential function has been misconceived. Sometimes its value is lessened by the infrequency of its meetings.

Granted that some form of medical advisory committee to each regional hospital board is desirable, its exact constitution may well be determined by local conditions. It should represent the active clinical life, not only of the regional hospitals but also of the medical school (or schools) in the region. It should include representatives of the more important specialties; but, since it is impossible to include them all, specialist advisory subcommittees will still be needed. It should include some, but possibly not all, of the medical members of the regional hospital board, so that its policy is understood and supported in the board. Appointment should be by nomination, supplemented by coöption. Nomination by regional consultants' or area advisory committees will permit of adequate areal representation; coöption will be required to ensure adequate representation of the important specialties.

I am grateful to the senior administrative medical officers to the regional hospital boards, who provided the information I have summarised.

A VISIT TO KOLTUSHI

The Study of Conditioned Reflexes

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WE had visited hospitals and laboratories during the previous ten days in Moscow and Leningrad, and talked, notebook in hand, to many doctors, all anxious to explain. Sooner or later there would be that odd conversation, begun with some remark such as this: "during the last few years we have tried to base our work on the teaching of Ivan Petrovich Pavlov." In some of the hospitals they then showed us conditioned-reflex laboratories for animals and for patients. In others they had departments for sleep therapy. And in all they attempted to interpret such familiar states as hypertension or peptic ulcer in terms of Pavlovian physiology.

A few of us had read some Russian journals and were familiar with this new outlook; to all others it was disturbing and elusive. One thing was certain: Russian doctors spoke of it with conviction and enthusiasm.

Now we were on our way to the premier centre of this new science—Pavlov's laboratories at Koltushi. This "Capital of Conditioned Reflexes" was constructed in 1929 in celebration of Pavlov's 80th birthday, and the new 28 laboratories were then linked with 6 other institutes in Leningrad itself and with several clinics.

Fifteen miles out of the city we turned off the main road into a quiet country lane and were soon entering one of the Koltushi laboratory buildings, the former home of Pavlov. Like all the other houses in the village it was two-storeyed and vaguely Tudor—out of place in the Russian countryside. Was it an idea owed by Pavlov to one of his visits to this country? The avenues and flower-beds lay almost deserted in the half-hearted September sunlight.

In the absence of the director, Academician Bikov, we were received by his deputy, Academician Airapet'yants. Surrounded by pictures and simple personal mementoes of the founder, we were first given a general outline of the work of the institute and of the principles of Pavlovian physiology. The objective of their study, we were told, was an understanding of the functioning of the organism in its unity with the environment.

GENERAL PRINCIPLES

An animal, said our host, is in a state of constant interaction with its environment. Descartes knew already that environmental factors determine the functioning of the organism by means of reflexes. Before Pavlov, however, only inborn reflexes were studied. Many important discoveries had been made, especially by such men as the great English physiologist Sherrington. But even Sherrington stopped short at the complexities of the brain, thinking that this was not amenable to study by physiological methods. This domain was left to psychologists.

The way to a new approach was paved by the Russian physiologist Sechenov whose *Reflexes of the Brain* appeared in 1862. Sechenov obtained experimental evidence that all the functions of the brain, including mental activity, were also carried out by reflex action. But the question remained: How does it operate? How is the interaction with the external environment achieved through the intervention of the brain? Pavlov's great achievement was that he posed these questions correctly and discovered a new scientific method of investigation, objective rather than subjective, a method that yielded more information than all the approaches of the psychologists.

Pavlov found that, besides inborn reflexes, there are others which arise from the individual experience of the animal. The basic inborn reactions may then be elicited in new ways and in new combinations by stimuli derived from the changing external environment. If any phenomenon capable of producing activity in a sensory pathway immediately precedes, or coincides in time with, the operation of an inborn reflex, this new stimulus can become capable of giving rise to the original inborn response. A dog is fed; a bell is rung at the same time. After a few combinations of the bell with the sight or smell of food, the bell by itself calls forth salivation. Any stimulus can act in this way and produce a reaction of the animal.

How and where is the linkage formed? The answer was given by Pavlov not so much verbally as in thousands

Building containing Pavlov's flat and the Laboratory of Academician Airapet'yants.

of experiments. Every stimulus capable of calling forth an unconditioned inborn reflex excites the unconditioned centres in the brain or lower parts of the nervous system, at a level or levels determining the corresponding activity. But every such excitation is also relayed to the cortex, the highest and most recently acquired part of the brain. Every external stimulus capable of giving rise to a conditioned reflex also excites the cerebral cortex—but somewhere else. A state of excitation is in this way produced at the same or nearly the same time in two parts of the cortex and a linkage established between them. This linkage is new and temporary, but if repeated can become stable. (Stable but not permanent. This lack of permanence is a fundamental property of a conditioned reflex. If the phenomenon which gave rise to it in the environment disappears or acquires a different meaning, the conditioned reflex is altered or inhibited.) Once it is established, the unconditioned response can be obtained by excitation of the conditioned point of the cortex in the absence of the "normal" unconditioned stimulus. A new reflex arc has been formed.

These processes are precise, subject to laws, determined. Thus any stimulus from the external environment, if repeated in association with the stimulus appropriate to an inborn reflex, can give rise to a new adaptive pattern of reaction. These new reactions are formed in the cortex, new conditioned reflexes allowing for the development of more intimately adaptive responses of the organism to the external environment. Thus deciphered, cortical activity can be defined as the processes involved in the relations between unconditioned and conditioned reflexes, and also between the conditioned reflexes themselves. In this way the animal becomes able to respond to an infinitely wider set of environmental agents than those which elicit inborn responses. The concept is radical. There is nothing left of mental activity except complex relations between reflexes of one kind or another. The mechanism of all mental activity is reflex. Sechenov was right.

Even such complex events as the whims of a child, the romance of a girl, the genius of Isaac Newton or of Garibaldi—all these are based on such reflexes. Pavlov in his books *Twenty Years' Experience* and the *Lectures on the Cerebral Hemispheres* gave precise experimental facts. He founded a new science, a real science of behaviour, the science of higher nervous activity. Conscious and adaptive human behaviour depends on the activity of the cerebral cortex; but this activity is not only the mechanism of mental processes but also the dominant factor in the development of the individual.

How are these processes localised in the central nervous system? Any approach to this question is based on three principles:

1. No event can take place in the cerebral cortex without a cause, immediate or distant, in the environment. There is no evidence for the occurrence of "spontaneous" cortical activity.

2. Localisation must be related to the function of analysis and synthesis at the same time. Pavlov demonstrated that the cortex may be regarded as a mosaic of analysers, each of which has a centrally situated nucleus and very widely scattered peripheral elements. The finest analysis takes place only if the nucleus of an analyser is intact, while cruder analysis and much compensation for lost function after injury may be accomplished by the peripheral elements. Synthesis—the formation of temporary linkages—cannot be localised to any one area of the cortex; it is taking place between all its parts.

3. Localisation must be related to structure. Here Pavlov opposed equally Lashley's theory of equipotentiality and the rigid mechanical concepts of localisation exemplified at present by the theories of John Fulton. He preferred to think in terms of "dynamic structures"—areas concerned with a complex association of unconditioned and conditioned reflexes, extending over variable and modifiable territory, not only in the cortex but also in the subcortical centres. He thought, in particular, of the motor area of the cortex not as an effector organ for voluntary movement but as an analyser of kinæsthetic stimuli reaching it from all muscles of the body, and, in man, especially from those in the hand and speech organs.

At Koltushi, continued our guide, we have a great advantage in being able to undertake studies of the pathology of human disease alongside our experimental work on animals. But the latter are essential for the knowledge of human activity. A correct theory is essential, and we believe that Pavlov's teaching provides the only correct theoretical approach to the study of functional relationships in animals and man. It is vital for the clinicians, who must learn that there is no such thing as disease in a single organ. Every organ which is in any way diseased must in some way, to some degree, affect the functions of the other organs and of the whole body. The whole individual is ill, wherever the lesion is located, the most important integration being achieved through the nervous system. The central problem in medicine is concerned therefore with the functions of the nervous system, with the elucidation of its laws of operation. Naturally, we do not exclude the study of other aspects of medicine and biology. We attach importance to other forms of integration and interrelation; but we insist that the highest regulation of the animal is through the central nervous system, and, in higher animals, through the cerebral cortex.

We asked if it was proved that the cortex alone was concerned with the formation of conditioned reflexes. The answer was that, where a cortex exists, the highest regulation takes place at the cortical level; but this does not mean that it can function without the lower levels of the brain and the nervous system. It has been demonstrated that conditioned reflexes cannot be formed if the cortex is extirpated. Conditioned reflexes can, however, be formed in certain animals, such as fishes, bees, and silkworms, in which a cerebral cortex has never been developed. In such animals it is the highest existing nervous ganglia which are concerned in the formation of conditioned reflexes.

GENETICS OF HIGHER NERVOUS ACTIVITY

We then moved on to another building to meet Professor Feodorov and to hear and see a demonstration of his work on the inheritance of conditioned reflexes.

Pavlov, he said, stated that conditioned reflexes must on a-priori grounds be inheritable and become, in the course of evolution, inborn unconditioned reflexes. During Pavlov's lifetime research had attempted to provide proof for this hypothesis; but the experiments were not decisive and the results could be explained otherwise. Recently work had been started again, using mice because they could be rapidly taken through a number of generations. A complicated piece of apparatus had been constructed wherein a mouse could be automatically released into a maze which if successfully negotiated led to a safe chamber. The passages could be seen and the movements of the mouse recorded by means of a large wall mirror placed at an angle above the apparatus.

We sat and watched entranced the little white animals making their way with uncanny precision along the narrow corridors of this strangely fun-fair-like installation. The pathways were floored by a series of metal bars which could be electrified so that, if the mouse remained too long en route to the safe chamber, he would feel a continuous mild electric shock until the objective had been reached. A bell or other neutral stimulus was set off and the mouse simultaneously released. After six seconds the electric current was automatically switched in. After a few experiences of this arrangement a conditioned mouse would proceed straight to the safe cell on release and would avoid any shock at all.

The experiment could be made more complex by shining a light instead of ringing the bell, and this time having the safe cell accessible only by a different route, which made it

necessary for the mouse to turn right instead of left if he were to reach the safe area before the current was switched on. It was possible to continue conditioning experiments so that the mouse would choose the correct path when the left and right routes were alternately opened with the same stimulus. Thus varying degrees of complexity in the conditioning process could be developed in a precise way.

All the conditions of this experiment allowed for its operation without any intervention by the experimenter other than pre-selection of the relation between the electric current, the pathway leading home, and the indifferent stimulus applied.

With this technique a group of animals was divided into two groups, one a control. The experimental group was trained to a given degree of complex conditioning and then allowed to breed as were the controls. Each generation of the non-controls was submitted to the same training process. After a certain number of generations the controls were tested for their ability to acquire more rapidly conditioned reflexes necessary to avoid the electric shocks, and thus compared with similar mice whose parents had been trained.

We were told that during the last few years this experiment had yielded decisive results, but that further experiments would be continued with a variety of other animals. It was freely admitted here that what had been in fact acquired were not particular conditioned reflexes but the capacity to form them in conditions of a persistent change in the environment calling for these reflexes.

These experiments are reminiscent, of course, of the work of McDougall and of Tryon and appeared to us to be of fundamental importance. It is with great interest that one awaits their publication and repetition elsewhere. This work is, incidentally, to be associated with studies of the minute structure of the brains of these animals, in an attempt to gain evidence of structural change associated with this evolutionary process which is thus being achieved in the laboratory.

COMPARATIVE PHYSIOLOGY

We moved on through the trees to the next laboratory for a demonstration of work on the comparative physiology of higher nervous activity.

The problem here was adaptation of young animals. Previously, we were told, many of the adaptation processes had been regarded as entirely dependent on the active rôle of the mother, with the young animal behaving more or less passively. It " contemplated " but did not adapt. This conception was considered improbable on theoretical grounds, but the problem of demonstrating the acquisition of conditioned reflexes in the newborn animal was difficult technically. Pavlov's salivation techniques were inapplicable and new methods had to be developed to suit different species of animals.

Experiments with puppies showed that conditioned reflexes could be formed in relation to the sense of smell immediately after birth.

Two days before parturition the bitch was specially cleansed and treated with a scent. Puppies taken away at birth would respond by withdrawal on presentation of a piece of cloth steeped in the scent. But after one experience of suckling, for even as little as five seconds, they would subsequently, when hungry, crawl towards the scented cloth, whining and behaving as they would normally towards their mother. With a different smell the response was totally negative; they turned their heads away and crawled back. Even premature animals showed this capacity for acquiring conditioned reflexes and were quite helpless if deprived of this capacity by division of the olfactory pathway. They were then unable to suckle when put to their mother and would starve unless given a great deal of assistance in feeding.

The first important analyser in the life of a puppy is that of smell.

By the fourth day puppies respond to adequate auditory stimuli, and by the fifteenth day conditioned reflexes can be established to sound.

A bitch is kept in one cage, the puppies in another. The bitch is allowed to visit the puppies, but this is accompanied by sound. After two or three combinations of sounds and the mother's visit the puppies will respond to sound alone as if the mother were approaching.

Similar types of experiment using the visual analyser showed that conditioned reflexes could be established at 25–30 days. Further experiments studied the establishment of conditioned reflexes through the vestibular apparatus.

Birth took place in a box on springs the vibrations of which could be recorded. The puppies could be conditioned to react to any movement of the box as to their mother's approach. If born in a non-moving box puppies would not respond to such movement. These conditioned reflexes could be obtained by the twelfth day.

Further experiments of this kind were concerned with the problem of types of higher nervous activity. Pavlov's detailed studies of the reactions of animals had led him to appreciate the significance of differences in the response of different animals to attempts to induce conditioned reflexes. He found among his animals dogs with strong nervous systems and with weak ones. The strong ones could be further subdivided into balanced (phlegmatic) and non-balanced (choleric). From the viewpoint of the mobility of the nervous processes the strong balanced animals could be either mobile (sanguine) or inert. It will be seen that this classification resembles the Hippocratic one of human temperaments, the weak dogs suggesting the melancholic temperament. Experiments have been now pursued in this laboratory with the object of creating and changing such types.

Experiments were begun as soon as the dog could leave its mother. Some were given the maximum free contact with their environment; others of the same litters were to some extent isolated. These changes were associated with deliberately varied diets. Different types of higher nervous activity could be deliberately produced in this way, and, in early stages of life, changed in a desired direction. In fully grown dogs, it has been found, the basic properties of the nervous system are almost impossible to change, though existing qualities can be enhanced or moderated.

The experimental production of types has been linked with the study of the emergence of the various sensory analysers. A current experiment was dealing with the relation between *subliminal* painful stimuli and the effects of stimulation of the auditory analysers.

Litters of puppies were divided into three groups. One group was fed while rattles were sounded; a second group was subjected to the rattles plus subliminal painful electric stimuli; a third acted as controls. This was continued for six months with careful observation of behaviour during this period. The puppies in the second group developed slowly a passive defensive reaction behaving as though they were frightened. The first group and the controls developed no such reaction.

After six months they were all given Pavlovian salivary fistulas so that their salivary secretion could be used as an indicator of the production of conditioned reflexes. The dogs which had been subjected to the rattles plus the painful stimuli formed no conditioned reflexes; their cortex seemed to be in a permanent state of negative induction—inhibited. The dogs subjected to the rattle treatment only were strong and highly reactive—more so, indeed, than the controls. In addition, the inhibited animals did not grow well and became bald. Attempts were made subsequently to cure them by a complete change of environment. In some of them this could be done, but others remained permanently abnormal.

Another point of interest in relation to the reactions of the organism to infection was that it had been shown that a leucocytosis could be produced as a conditioned reflex.

BIOCHEMISTRY

In another laboratory we discussed the contribution of biochemistry to the Koltushi research on conditioned

reflexes. Pavlov had envisaged that in course of time the complexities of the brain structure—its microscopic morphology—would be related to the processes underlying the formation and interaction of conditioned reflexes, and that biochemistry would throw light on the molecular nature of the processes involved in nervous activity. Biochemical research had, however, lagged behind.

An approach was now being made to the basic processes underlying cerebral activity. Already it had emerged, for example, that the cortical processes of the dog and the rabbit are biochemically very different. Again, whereas it was previously thought that the white matter of the brain, consisting largely of connecting fibres, is essentially passive in a functional sense, it has been found that biochemically the white matter is often more active than the grey. The task is to extend our biological knowledge of nervous processes and particularly of those underlying the development and interaction of conditioned reflexes in the cortex. Histochemical methods were showing, for example, that the distribution of nucleic acid in the nerve-cells differed with different functional states—with excitation and inhibition, both conditioned and unconditioned.

CORTICO-VISCERAL RELATIONSHIP

Regretting the absence of a biochemist amongst us, we proceeded to the next laboratory—of Academician Airapet'yants, our host and guide. He wished to tell us something of the studies on cortico-visceral relationships on which he had been working with Academician Bikov, but thought we had had a long morning and were perhaps tired. We asked him how long he would take to tell us of the work. He said that it could be done, perhaps, in three hours, or three days, or three weeks, or three years, but he would tell us a little in twenty minutes and then there would be time for questions. We agreed.

Bikov was one of Pavlov's pupils and has been engaged in this work for the last twenty years. It was necessary to show experimentally that the cerebral cortex really controls, without exception, all functions of the body, and that conditioned reflexes can be developed in connection with all functions of the organism. It has, in fact, been possible to establish conditioned reflexes using a large variety of bodily functions—secretion of bile, secretion of urine, intestinal peristalsis, and vascular reactions. All reactions which can appear as a result of appropriate stimuli as unconditioned reflexes can be evoked by any indifferent stimulus which coincides in time.

Ingestion of a lot of water will result in diuresis. If this drinking is accompanied by the ringing of a bell, then later the bell alone will evoke diuresis. Excitation spreads along a cortical path which has now been established and the kidney is brought into operation. If such things can happen in ordinary life, they can also happen under pathological conditions. Pathological processes can never take place without involving in some way the cerebral cortex. The pathological state of an organ does not necessarily originate in the cortex, although it may do so, but the cortex always plays a part in the development or arrest of any pathological processes.

What is important here is to take the argument a stage further. If the cortex controls and regulates internal organs, is it in its turn influenced by them? If we can form conditioned reflexes to external stimuli, can conditioned reflexes be likewise formed by "indifferent" stimuli arising within the body? To answer these questions has been the particular task of Airapet'yants's laboratory.

Let us take for example a dog with a gastric and a salivary fistula. You introduce some water or a balloon into the stomach, carefully, so as not to affect other sense-organs. No saliva will be produced from the salivary fistula. Now you combine gentle gastric dilatation with feeding. After a few combinations the gastric dilatation alone will stimulate the flow of saliva. A full stomach has begun to stimulate appetite!

From this and similar experiments with other organs it is concluded that the stimulation of any organ, of threshold intensity, leads to excitation of the cortex. If this is accompanied by excitation of another cortical area by a stimulus derived from another organ there is, as with external stimuli, a linkage: a conditioned reflex can be established. The cortex is capable of responding to stimuli from all somatic organs and viscera—mechanical, chemical, and physical—by analysis and synthesis, by the development of conditioned reflexes. It can react to degrees of temperature, concentration of chemical substances, and chemical differences. As with the external environment, so all reactions of the internal environment operate through reflexes, and these too include conditioned reflexes. All this should not be interpreted, however, in the sense that processes in organs can be "primary" or "spontaneous." They do not occur without a cause in the environment, either immediate or more remote.

This, we were told, is not only of importance to theory and to philosophy, but also to clinical medicine. On a-priori grounds it may be assumed that the human organism, like that of animals, operates through such reflexes, but it is also necessary to observe this in man. We need proof and detailed understanding of the mechanisms. The operation of the brain is, moreover, more complex in man because he possesses a second signalling system. (The discovery that words operate as conditioned signals of a second order was one of the most remarkable chapters in the work of Pavlov. Towards the end of his life he came to grips with one of the most mysterious problems of cerebral function—the nature of human thought. He found that it was intimately related to speech. This in its turn was mediated by conditioned reflexes of a more complex character constituting an additional signalling system capable of greater adaptability to a much wider range of environmental influences—making possible, indeed, such processes as "abstract thought.")

In the final stages of our visit we discussed some clinical experiments which showed that changes in visceral function can be produced by previously indifferent stimuli bringing into action special associations which have been formed with words and figures. In patients with peptic ulcer, for instance, contractions of the stomach are associated with sensation of pain. By a process of conditioning, the figures on a clock could be made to produce both contraction of the stomach and the pains of an ulcer. Thus we were shown something of the experimental basis for sleep therapy in certain diseases, one of the effects of which is to exclude the harmful action of a whole range of environmental stimuli which have become associated with pathological processes.

CONCLUSION

It was time to leave. We wandered out into the open and looked at the growing village with its new laboratories, and homes for those who work in the laboratories. We saw some special rooms for the more complicated experiments on dogs and apes. They are designed to eliminate accidental features and the impact of the observer on the experiment. (We had seen on other occasions how fond the physiologists were of playing happily with their experimental animals "after hours"). The rooms are elaborate and sound-proof. Mechanical contrivances present the dog with a plate of food on the pressing of a button. Innumerable controls operate a wide range of stimuli. Special recording devices register changes in the secretion of the saliva and of other visceral functions. There were other simpler fixtures designed for

use in any laboratory undertaking work on conditioned reflexes.

We shook hands and exchanged compliments. Half an hour later we were threading our way cautiously past ruts and pot-holes in the as yet unfinished streets of the advancing Leningrad outskirts. It was three or four hours that we spent at Koltushi, and we had no more than a glimpse of the new science. Was it a glimpse into the future?

PREVENTION AND MENTAL HEALTH

Conference of the National Association for Mental Health

OPINIONS differ about the possibility, in the present state of our knowledge, of preventing mental ill health; but there is a general feeling abroad that in time research will bring enlightenment about this and many other aspects of mental-health work. At this year's annual conference of the National Association for Mental Health, held at the London County Hall on March 24–25, with Mr. KENNETH ROBINSON, M.P., presiding, Mr. IAIN MACLEOD, the Minister of Health, opened the first session.

OPPORTUNITIES IN THE HEALTH AND EDUCATION SERVICES

Mr. MACLEOD spoke of the fears and prejudices about mental illness which still hinder both the use made of the mental hospitals and the recruitment of nurses. General practitioners and voluntary workers, who can do much to educate the public, should be well informed about recent advances in the mental field. Mental hospitals are arranging open days and forming leagues of friends; and the press and the British Broadcasting Corporation are helping greatly in spreading information. Probably all mental disorders are of multiple origin, but it seems clear that in their prevention we must go back to old wisdom, recognising that lack of love, lack of companionship, and lack of security are potent causes of breakdown. There are now 650 outpatient clinics in the country for adults and children who need treatment. On the preventive side, local authorities have the power to provide community services; but though they undertake various types of work which may be called preventive, they have been slow in developing a formal pattern. Their opportunities for preventive work among children—through the health visitors and the maternity and child-welfare clinics—are very great. Health visitors, indeed, are taking an increasing interest in the subject; and a working party is now considering how their training should be revised and widened. He had, he said, asked the local authorities, last November, to do all they could to prevent the break-up of families. Once a child leaves school he has no routine public-health supervision; hence it is important that his family doctor should be in full touch with local-authority services, so that he can call on them when necessary. It is not yet possible to advise local authorities, by circular, on what mental-health services they ought to provide, but they are being urged to take a keen interest in this work. Public education will gain momentum as patients and their relatives get a new awareness of mental hospitals and their services. Mental-hospital buildings are expanding under the new programme; and with better buildings we can look forward to attracting more recruits to nursing.

Dr. F. A. E. CREW, F.R.S., professor of public health and social medicine in Edinburgh University, said that medical knowledge has so far contributed little to the prevention of mental illness. He sees no real hope of a speedy solution to this problem, but thinks that social, as opposed to individual, studies provide some clues.

A Chicago survey of mental-hospital patients suggests that not only mental illness but social factors, such as poverty, crime, and suicide, are related to a particular factor—namely, "social isolation." This finding is supported by experience in New York, that mental illness is commoner among immigrants than among the native-born population, and among the children of immigrants than among native-born children. The newcomers, until they are absorbed fully into the new culture, are lonely and isolated. A study, made in London boroughs, has shown a negative correlation of suicide with poverty, but a positive correlation with loneliness. Other investigations, in Massachusetts and in Norway, have shown that the chances of admission to mental hospital are greater for the unmarried, widowed, or divorced, particularly men, than for the married. Either those who marry, Professor Crew said, are less liable to mental illness than those who remain single, or else marriage is protective. He mentioned also a study, not yet published, made in Edinburgh by Dr. Donald Cameron, of the places of origin of mental-hospital patients. He found that the admission-rate of those from the Highlands and from foreign countries (which did *not* include England and Wales) was higher than that of the Edinburgh-born; and that among the patients the single were twice as numerous as the married.

Such findings, Professor Crew went on, cannot be fully interpreted without more study. What is marriage? In this country a reasonable prerequisite for the founding of a family, that microcosm in which children can mature; an opportunity for emotional and sexual security; and also, in the lovely phrase of the Prayer Book, "for the mutual society, help and comfort that the one ought have of the other." The married person is no longer alone but a member of a group with bonds of affection, and with a place of his own and things of his own—a refuge. This may determine whether or not he goes into a mental hospital, and if he does how long he stays there. Our society has produced conditions which are to a greater or less extent intolerable: in it there are many bewildered and perplexed people without a purpose. During the war the mental health of the country was surprisingly good: the lonely were rescued—there was a place and function for all. The causes of mental ill health are partly individual and partly environmental; and while it is desirable to plan for a society in which causes of mental ill health are removed, we need to know much more before we can create such a society. At present we can only attempt to stem the torrent.

The rise in the admission-rate to mental hospitals is not trustworthy evidence of an increase in mental ill health, because patients are now going in voluntarily, hopefully, for treatment. But the incidence may be rising, and that may be either because our stock is deteriorating or because the circumstances of life increasingly provoke mental illness. We must find out which. We cannot be mistaken, however, in attempting to remove those provoking causes which we know. It is important for mental health that the individual should be attached to a faith, a cause, a purpose, which yields serenity. We talk of mental health without knowing what we are talking about; but if it is peace within, and peace within the environment, it is perhaps a matter of philosophy rather than the ticking of a machine. What a man does should be within his competence, of value, and regarded as valuable by others. He must not feel he is an outcast but a part of a group; he must take into marriage an understanding of what it involves, and know something of his own sexual nature. (For the young person, Professor Crew remarked in passing, a motor-bike is no substitute for a cage of mice.)

During the war, the Navy and the Royal Air Force had the more intelligent recruits; the Army got all the dull, the neurotic, and the unstable. It is no longer true that the dull man makes the best soldier: he needs, today, average intelligence and not a little technical skill. The duller men in the Army were apt to become maladjusted and neurotic absentees. In the Pioneer Corps, however, there were some men too intelligent ever to have been sent there, and they too became neurotic: they benefited by being given more responsible work. No man should be employed in work either above or

below his mental capacity. Doctors, instead of signing certificates saying a man is not fit for his job, should perhaps start signing some which say: "Job not fit for man." We are dedicated, Professor Crew concluded, to the creation of an environment optimal for human life. This is a cause which can claim our unrestrained devotion, and one from which we can hope to derive abiding joy.

PRACTICAL PROBLEMS IN LOCAL-AUTHORITY SERVICES

In opening what the CHAIRMAN described as a "grumbles session," Dr. J. L. BURN, medical officer of health for Salford, offered as his first grumble the lack of recognition of the importance of mental health in local-authority schemes. They spend far less on it than on their other health services and place too much emphasis on the mental hospital and too little on the home. "Only when other public-health resources (such as rehousing) fail," he said, "do we think of mental care," and this is an expensive way of arriving at a diagnosis. Many opportunities of preventing ill health could be taken with little expenditure. The antenatal clinics could be used more freely for teaching, the club idea could be extended, group therapy encouraged, some family doctors might be persuaded to send patients earlier for treatment, hostels could be provided for mental defectives, and educationally subnormal children (who provide a high proportion of delinquents) could be supervised for three years after leaving school. The break-up of a family often dates from their eviction for non-payment of rent: there are no statutory funds to tide them over such a crisis (though health visitors often lend what is necessary out of their own pockets). He urged the need for more "bridges"—such as case-conferences between hospital and local-authority staffs before a patient leaves a mental hospital.

Miss E. STEPHENSON, chief nursing officer at Newcastle upon Tyne, as a nurse, midwife, and health visitor, has good opportunities for observing the barriers our services build up between each other. (Some of them, she said, are themselves suffering from mental ill health: they need to foster good family relationships within their home departments.) In the home the family doctor, the health visitor, the midwife, and the district nurse are all preventing mental ill health by being good listeners. It is part of the health visitor's job, in addition, to teach good living; but she needs to know when to call in an expert, and to have an expert at hand to call in. She, too, since she knows the family, ought to be invited to attend case-conferences.

Miss S. FRIEDMANN, educational psychologist to the City of Oxford, regretted that local authorities have so little sense of urgency about mental-health work. They would never dream, she said, of appointing one dentist for one afternoon a week to look after the teeth of a population of 10,000 children; but they often appoint only one psychiatrist to such a population—though mental growing-pains are just as common as toothache. The child-guidance clinics have enormous waiting-lists, and children may wait a few weeks or a few years for treatment—which should be given early, and neither late nor as a last resort.

Mrs. M. ORMEROD, chairman of the joint Bethlem Royal and Maudsley Hospital board of governors, and member of the London County Council health committee, said that the grumbling of the experts had fairly and squarely exposed the faults of the local authorities. She is, she said, a reasonably good mother, but whenever she interviews a nicely dressed woman with two clean and nicely dressed children, and learns that they and the father are living in one room—eating, sleeping and doing the family washing in it—she wonders what sort of mess she would have made of a like job. Something can be done by education committees, and fortunately Londoners like spending money on education. She thinks that every penny spent on child guidance and on classes for the educationally subnormal child is well invested, helping to prevent both mental ill health and crime. But housing, of course, is a more difficult matter. She spoke of the closer coöperation of the psychiatrist and the family doctor which has been achieved in Amsterdam. The Maudsley Hospital, she said, is hoping to start a domiciliary service with a view to keeping more patients in their own homes for treatment. We have some glimmer of how to make people secure: we know security is based on happy family life. Sir Geoffrey Vickers [1] has described the most important promise of mental science as that of "helping us to conceive of mental health as a positive dynamic condition of mind, to see the path towards it, to develop the will to achieve it." "We members of local authorities," Mrs. Ormerod said, "must develop the will to achieve it."

PROMOTING MENTAL HEALTH IN A LOCAL COMMUNITY

Dr. S. A. MACKEITH, consultant psychiatrist to a group of Norfolk hospitals, pointed out that local authorities are desperately short of psychiatrists and psychiatric workers, whereas regional hospital boards, though they have not enough of these workers, do nevertheless employ considerable numbers of them. He suggested that the boards should permit, and indeed encourage, their psychiatrists to devote one session a week of their time to mental-health work for a local authority—*not* in fresh treatment clinics but in preventive mental-health fields found by experience to be fruitful. He himself had asked the medical officer of health of a local authority to allow him to work for one session a week in a maternity and child-welfare clinic, where he hopes to learn, in time, how to spot at an early stage the over-anxious or otherwise disturbed mother who will be bringing her child to a child-guidance clinic in 5–10 years' time. An experienced psychiatrist working part-time for a local authority might help in various ways—by holding discussion sessions for midwives and health visitors, attending meetings of the medical officers employed by the authority, and acting as psychiatric adviser to the M.O.H. and psychiatric catalyst to the medical work of the local authority generally. The training of duly authorised officers, he thinks, should be weighted on the social rather than the psychiatric side, but nevertheless they should have some training in psychiatric case-work. This should be given by psychiatric social workers, who, like the regional board's psychiatrists, should be encouraged to give a little time each week to the local authorities. They should be asked, especially, to advise at reception-observation centres for children.

He mentioned the Amsterdam scheme,[2] in which the psychiatrist, before recommending any treatment, interviews the patient in his own home. Other experiments deserving wider study are the day hospital, and the night hospital (from which patients go out to work). Psychiatrists might also help local authorities by advising on the appropriate treatment of old people with mental disorders. We are still too ill-informed about prevention to be dogmatic, but one important thing is to respect the point of view of the other fellow. "Let us not rush to tell other people how wrong they are in what they are doing." He believes in supporting the authority of the family and increasing its self-confidence—particularly the self-confidence of the young mother in her feelings and impulses toward her child. Whatever we do, growing up from infancy will always be a strenuous and frustrating business, adolescence a stormy time, and no amount of tactfully given information about the facts of life will alter that. Perhaps good mental health, like good morale in an army unit, cannot be achieved by direct means; perhaps it is, he said, "the bloom on the fruit of a really sound society."

1. *Lancet*, March 12, 1955, p. 521.
2. See Ling, T. M. *Ibid*, 1954, i. 1127; *Ibid*, p. 1117.

In England Now

A Running Commentary by Peripatetic Correspondents

ONCE in the days of our master, the Commander of the Faithful, Haroun El Rashid, on him be peace, in the season of the ripened dates, there came two wise men riding from the west. And after they had shaken off the dust of the plains they sought the ear of the Caliph. But Abu Newas, his wazir, stopped them at the gate of the City of Peace and said: What manner of news do you bring from the Land of the Free? And the first wise man said: Lo, we bear a magic potion for your maidens and your young men, that they may smile upon each other with pearls as white as asses' milk in the moonlight. That your wives shall not spit their teeth into the dust when they are heavy with child. That your aged ones shall not chatter false mouthings in the market place. And Abu Newas was glad in his heart, for he found joy in both the comeliness of maidens and the flesh of a roasted sheep.

So the wise men were led into the presence of the Caliph. And Haroun El Rashid heard their say. And Abu Newas whispered: Give them a thousand dinars, O master, for they worship gold in their land, and let us have neither holes in our teeth nor pains in the night. But the Commander of the Faithful said: Stay! I would first know how this magic potion, which you call Fluor, shall be given to my people. And the first wise man replied: It shall be poured into every well in your kingdom, that all must partake of the blessings of mankind. But Haroun doubted and said: How shall I know that it will not harm my people if they drink too much? And the second wise man replied: Their teeth will become mottled as the camel's and their backs as stiff as rocks, but see, we have a thousand scrolls in our caravan to bear witness to the wisdom of our wise men. And Abu Newas whispered: Their people worship a god called Science only a little less than gold. Let us test their magic on thirty-six of our children. And Haroun said: Let it be so.

But many moons passed, and Abu Newas had to slip with the cunning of a jackal through the time of Questions. Some of the thirty and six children were changed by magic into men and women, and the scrolls were lost in the secret registry. And Abu Newas cried three times that the wise men of the west must be wiser than any tests. But the Commander of the Faithful was beleaguered by his wives, who made much song and dance, and said: It is against the will of Allah to medicate the masses. It is not justice to make your people of all ages drink this Fluor when even the wise men say its magic spell works feebly after eight summers have passed away. And yet other zealots trailed strange western fish called herrings across the palace yard. And the Commander of the Faithful held his head and groaned: Bring me a goatskin of wine, and cast this noisy mob into the river that they may take their fill of water. And cast Abu Newas and the wise men in as well, so that once more I may rule over the City of Peace. Let it be so.

* * *

It's the nights that get me down. A typical night in our family goes like this. Midnight, I've just got warm and am dropping off when banshee wailing from Second Child recalls me. I get up, find my slippers and dressing-gown, and stagger down the arctic stairs to get him a drink (warm orange, in pink mug—no other acceptable) and deal with his other metabolic needs. Then, cursing roundly, I tuck him up and go back to bed, to find my husband hogging my warm patch and snoring heavily. A few sharp kicks right this, and I settle down and am deliciously warm and sleepy when agonising howls from Third Child break out. Same procedure as before. She is starving and soaking. I apply her drink (warm milk in a red mug) to the appropriate end and dry towelling to the other, fling her back in her cot, and stamp off to bed again. This time I manage to snatch a little sleep, and it is 3 A.M. before First Child has a nightmare, and eldritch screams of "Mummy, Mummy—there's a fire engine in my bed!" have to be dealt with. (He has cold blackcurrant in a blue mug.) The cat is now in my warm place. . . . In the morning my husband asks brightly, "Well—what sort of a night did you have?"

* * *

Professor A decided to telephone Professor B to see if they could go to a committee meeting together. Professor A is a busy man and he cannot be expected to hold on to a telephone line while the nurses look for Professor B. So he has a secretary to whom he says "Get me Professor B on the phone." Professor B is equally busy and he cannot be expected to answer the telephone himself, or to hold the line while someone's secretary says "Will you hold the line, Professor A would like to talk to you." So Professor B also has a secretary who answers his telephone and puts through his calls.

When Professor A's secretary asked Professor B's secretary if Professor A could speak to Professor B, Professor B's secretary felt some alarm. It appeared that on a previous occasion when Professor A had telephoned Professor B, Professor B's secretary had gone to a great deal of trouble to find Professor B, who was in the middle of a ward round at the time with some 15 or 20 lesser beings following him. Unfortunately when he got to the telephone Professor A's secretary was unable to find Professor A. With great presence of mind she had said that Professor A had been called away suddenly, but Professor B did not believe this story—and indeed he was quite right, since Professor A was known to be rather forgetful and had actually gone off to the laboratory to look at some kymograph tracings. Professor B's secretary therefore produced a general solution to all problems of this nature; she simply announced that Professor B was engaged at the moment and that he would telephone Professor A when he was free.

Those who have the gift of seeing general principles behind the ordinary details of everyday life will at once grasp the fact that this story shows up a fundamental problem which we might call "the law of telephonic precedence." Stated as simply as possible it implies that a great man shall not be made to give way to a lesser man in answering telephone calls. One difficulty remains—that of establishing rules for settling precedence. And here I think we are entitled to some help from the National Health Service. Many secretaries lacking in experience would be greatly helped if they had some system of finding out a man's importance quickly. What about a simple scoring system? 10 marks for a consultant or a professor, 8 for an F.R.C.P., 6 for an F.R.C.S. or an M.R.C.O.G., 4 for lesser qualifications like D.P.M., M.D., or F.R.S. Hospital appointments on the medical staff would range from 7 to 2 and there are some delightful possibilities involving very small fractions with irrational solutions for non-medical supervisors and administrators. Anyone in receipt of a merit award takes top priority.

* * *

I was new to general practice, and Social Medicine had loomed large in my training. When I came across my first example of gross overcrowding I wrote a stiff letter to the housing authority. They fell for the story and Mrs. W. was offered a house on the new housing estate. On Friday evening she came to the surgery to thank me. She and her family of four would exchange their one room for six the next day.

On Saturday morning Mrs. McG. came to add her family of five to my medical list. She had moved into Mrs. W.'s room. "And could I have a letter for the housing like you gave Mrs. W.?"

* * *

The old man in my outpatient clinic complained of indigestion, but seemed unable to give me a coherent account of his symptoms. Eventually in desperation I asked him how he knew he had indigestion. He brightened at once. "The X-ray showed a septic cat in my duodenum." In astonishment I said "A septic cat?" "Yes," he replied "a septic cat. I don't know what they meant, but that's what they said; a septic cat. They've been treating it with milk."

* * *

Is it true, or is it a rumour, that the manufacturers of dexamphetamine are living on the fat of the land?

Letters to the Editor

MUSCULAR DYSTROPHY

SIR,—The Central Council for the Care of Cripples has decided to form a Group or Association of patients suffering from Muscular Dystrophy, and has already found that there is considerable interest in such a development, particularly among the patients and their parents. Numerically the problem is not a large one, but the people concerned are often isolated, and it is the Central Council's intention to establish a friendly link, to provide interest and amusement for the children, and to distribute leaflets of general information to parents, members and others.

It is beyond dispute that research is of paramount importance, and your readers will agree, we feel, that there can be no firmer basis on which to develop the work which is contemplated than through the advice and support of the many distinguished neurologists and other specialists who have accepted appointment to the Medical Advisory Committee which the Council has set up.

The chief difficulty from the Central Council's point of view as a voluntary society is to find the people it wishes to help. Nevertheless ascertainment of the extent of the problem is an essential if real progress is to be made. I am therefore writing to ask anyone in sympathy with this movement to put their patients or others known to them in touch with the Central Council for the Care of Cripples. I must emphasise that the Group will remain within the ægis of the Council, which intends to use its existing County Associations rather than to superimpose a new organisation.

Central Council for the Care of Cripples,
34, Eccleston Square,
London, S.W.1.

HARRY PLATT
President,
Muscular Dystrophy Group.

HALLUCINOGENIC DRUGS

SIR,—We hope you will allow us to voice a word of warning regarding the use of the so-called "hallucinogenic" drugs, notably lysergic acid diethylamide (LSD 25). Although its application, especially as an adjuvant to psychotherapy, is suggested by recent work,[1 2] we feel that too little as yet is known about individual differences in susceptibility to warrant its use except under closest supervision. Our own observations in normal volunteers, and reliable reports from colleagues, suggest that:

1. During acute intoxication the subject may potentially be a danger to himself and to others.
2. In single instances a delayed and exceptionally severe response may take place, and be followed by serious after-effects lasting several days.
3. Early psychotic conditions may be aggravated by the drug.

Until more is known about its mode of action, we urge those interested to refrain from using the drug in out-patients or in day-hospital patients, and restrict its use to inpatients—and then only when constant supervision by trained personnel is available. At this early stage it seems to us wise to tread cautiously, and to protect what may be a promising new method from indiscriminate use and untimely haste.

Department of Experimental Psychiatry,
University of Birmingham.

C. ELKES
J. ELKES
W. MAYER-GROSS.

BURNS FROM ELECTRIC BLANKET

SIR,—An unusual domestic hazard which may face young children was recently illustrated in my practice.

A 4-year-old boy was sleeping in his parents' bed, in which an electric blanket had been placed beneath the lower sheet. The heat control had previously been set to the minimum. The mother found the child unconscious and rigid; the father, in attempting to rouse him, received a not inconsiderable electric shock from the boy's body. The blanket having been disconnected, the sheet was found to be saturated with urine, and the child had suffered full-thickness burns of the skin of his back, buttocks, and thighs. He rapidly recovered consciousness and was admitted as an emergency to the nearest hospital. Subsequently he was transferred to a pædiatric burns unit.

Since the use of electric blankets is becoming increasingly widespread both in homes and in hospitals, the dangers of their use by infants, young children, and enuretics should surely be stressed. Moreover it should be incumbent on manufacturers to make provision for adequate earthing, and preferably to fit an automatic cut-out to counter an accidental short-circuit.

London, N.11. NEVILLE DAVIS.

JOURNEY'S END

SIR,—A year ago, in an article entitled African Journey,[1] I recorded some impressions of a trip from Cape Town to Cairo during which I visited the main medical centres in the Union of South Africa, Southern Rhodesia, British East Africa, and the Sudan. From evidence obtained at many clinicopathological conferences I came to the conclusion that certain diseases, which cause a vast amount of ill health in Europeans, are much rarer in Africans. They fall into two main groups:

(1) Diseases which are commonly called "psychosomatic" by those who believe that emotional factors are of major ætiological importance—e.g., peptic ulcer, essential hypertension, rheumatoid arthritis, and toxic goitre.

(2) Diseases which may be caused by metabolic factors—e.g., atheroma and its sequelæ (cerebral thrombosis, coronary thrombosis, and peripheral vascular disease), cholecystitis and gall-stones, and diabetes.

This difference in prevalence could be attributable to racial and constitutional factors or to environmental factors such as diet, housing, and associated infections. In concluding my article I suggested that if the diseases which are commoner in Europeans than in Africans are due to environment rather than race their prevalence should be conspicuously higher among those Africans who have adopted Western customs, eat Western food, and are submitted to the emotional strains of modern civilisation. To complete my African Journey, therefore, I went last December to the Southern States of the United States of America, so as to obtain information about the prevalence of these diseases in the American Negro.

When I previously visited South Carolina and Georgia thirty-two years ago, the economic, social, and educational state of the vast majority of coloured people was exceedingly poor. Malnutrition was rampant, housing conditions were usually deplorable, and the daily wage was often as low as 50–75 cents. Two world wars, and the industrialisation of the Southern States which has resulted from them, have led to a revolution in the living conditions of the Negro.

Alike in the factory and in the field he receives the same rate of pay as his white neighbour (perhaps 6–12 dollars a day). A Negro woman doing domestic work is paid 6 dollars a day. Negro boys and girls go to well-constructed primary and secondary schools and many proceed thereafter to college. The average coloured family lives in a house which, though the general standard has greatly improved, would still be considered unsatisfactory by white people of the same economic class; but with less to pay in rent and taxes for his house the Negro may have more money than a white workman, on the same weekly wage, to spend on food, drink, tobacco, motor-cars, and other luxuries.

Standing in a main street in Charleston, South Carolina, one evening, I watched the stream of cars which carried the

1. Sandison, R. A., Spencer, A. M., Whitelaw, J. D. A. *J. ment. Sci.* 1954, **100**, 491.
2. Sandison, R. A. *Ibid*, p. 508.

1. *Lancet*, 1954, i, 614.

workers back to their homes in the suburbs and in the surrounding country. There appeared to be more cars driven by coloured people than by white people, while the condition, make, and size of the cars seemed to be the same in the two groups.

In one generation the material prosperity of the American Negro has been transformed; and at the same time malnutrition and deficiency diseases (such as pellagra) have virtually disappeared, malaria has been eradicated, and many diseases such as enteric fever and dysentery, which are associated with bad hygienic conditions, have been greatly reduced. On the other hand, material prosperity does seem to have been bought at a considerable price; for everyone with whom I discussed this matter told me that the psychosomatic and metabolic diseases have much increased among the Negro population of the United States. Dr. V. P. Sydenstricker, professor of medicine in the University of Georgia, informed me that whereas at the beginning of his professional career forty years ago these diseases were rare among Negroes, they are now very common. Several distinguished physicians told me, indeed, that Negroes are now developing malignant hypertension and the collagen disorders more severely and at an earlier age than white people.

The evidence before us leaves little doubt that the origin of many diseases is closely related to the working and living conditions and eating habits of Western civilisation. The relative importance of metabolic and emotional factors in the ætiology of these diseases remains to be ascertained. We are also left with the question whether people who have once enjoyed the material pleasures of modern times will ever be willing to return to a simple agrarian life.

Edinburgh. STANLEY DAVIDSON.

INVESTIGATION OF METABOLIC DISORDERS

SIR,—My colleagues and I are investigating the population genetics of three rather rare metabolic disorders: pentosuria, cystinuria, and alkaptonuria. We should be very grateful if general practitioners and consultants could put us in touch with patients known to have any of these disorders.

Department of Biochemistry,
London Hospital Medical College,
Turner Street, London, E.1. H. HARRIS.

AIR EMBOLISM

SIR,—Dr. Snell (March 19) rightly says that lowering the head as a first-aid measure may be life-saving in this emergency and adds, but does not stress, "preferably with rotation to the left side." He speaks of "pleural shock" and "obstetric shock" together as if, when due to air embolism, they were of the same kind, whereas the former is arterial and the latter (primarily) venous.

In arterial air embolism such as may cause "pleural shock" in artificial-pneumothorax therapy, air can reach the brain and cause many, often transient, symptoms; but it can also enter the right coronary artery and kill the patient quickly. In the left lateral position the uppermost part of the beginning of the aorta will be the part without a coronary orifice, and therefore in this position the risk of coronary air embolism should be lessened. It would be interesting to know on which side the patient was lying in cases of death from air embolism complicating artificial pneumothorax therapy.

There are two reasons why in venous air embolism also the left lateral position is important: (1) arterial (coronary) air embolism may complicate entry of air into a vein paradoxically because of a patent foramen ovale; (2) venous air embolism causes froth in the right ventricle but there is experimental evidence that this is less likely to block the outflow tract when the body is in the left lateral position.[1]

1. Durant, T. M., Long, J., Oppenheimer, M. J. *Amer. Heart J* 1947, **33**, 269.

No one doctor can speak from great experience of air embolism, and when he meets this emergency and has decided what to do it may be too late. I think that in artificial-pneumothorax therapy, intravenous therapy, and indeed in any procedure which might be complicated by this or any other accident the doctor should, before starting, give thought to what might go wrong and what he would do if it did. First-aid measures in air embolism should include turning the patient on to his left side in addition to withdrawing the needle (if any) and lowering the head.

Chase Farm Hospital,
Enfield, Middlesex. C. ALLAN BIRCH.

FIBRO-ADENOSIS

SIR,—I have been expecting someone to comment on your annotation of Jan. 1. Under the heading of Fibro-adenosis it gave a brief summary of an investigation by Dr. Kiaer on the potential dangers of (according to a footnote) fibro-adenomatosis or chronic mastitis. The confused nomenclature makes it difficult to assess the value of any investigation.

"Fibro-adenosis" as a comprehensive title was suggested by Atkins to include a number of structural changes in mammary tissue. "Fibro-adenomatosis," surely, is mostly a male affair, and covers the majority of enlargements of the male breast from childhood to old age. The terms "chronic mastitis" and "chronic cystic mastitis," inaccurate but harmless, originated from the writings of Astley-Cooper (1828), Benjamin Brodie (1840 and 1860), and Paul Reilus (1868) to become eventually—in the opinion of Foote and Stewart—little more than conditioned reflexes of the surgical mind.

At a later dater date Schimmelbusch (1892), Bloodgood (1923), and Cheatle and Cutler (1931)—who all, incidentally, combined the rôles of surgeon and histologist—were mainly responsible for raising doubt on the interpretation of one phase or histological pattern of "chronic mastitis" still often referred to as Schimmelbusch's disease. This state of mammary tissue has been persistently regarded by histologists as pathological, depicting, in effect, neoplasia of non-functional tissue.

For their impressions of a lump in the breast clinicians are largely dependent on abnormalities of the ground substance; and, when histologists threw doubts into their minds about epitheliosis, microcystic hyperplasia, and other microscopic findings, something of a grievance was developed and gradually displaced on to lumpy breasts in general. This misunderstanding between clinicians and histologists—who often, so to speak, live far apart—brought "chronic mastitis" under suspicion and was responsible for innumerable mastectomies, and at any age, more especially during the 1920s and '30s.

The very nature of this subject, dating presumably from the emergence of the primates, does not permit of clear-cut clinical and histological divisions, nor for that matter of a satisfactory comprehensive title. No uniform standard of structure and function applies to mammary tissue: rather has it "a wide variation from time to time and from individual to individual without parallel in any other organ in the mammalian body" (Creighton). Most of the common structural changes, however, fall roughly into two groups with a subdivision of the second:

1. Exaggerated physiological changes.
2. Pathological changes. Neoplasia. { non-invasive / invasive and irreversible }

In an important article[1] E. K. Dawson enters a plea that the terms "adenosis" and "fibrosing adenosis"—hypertrophy of functional tissue during adolescence, in adult life, with a pregnancy-lactation period, or during regression from fertility—should be maintained to

1. *Edinb. med. J.* 1954, **61**, 391.

describe the first group. Adenosis in this sense is neither a disease nor a menace.

On the other hand, once a neoplasia is established, its destination may be earmarked, biologically, from the start; yet histological confirmation, one way or the other, may on occasion be near impossible. A variety of physiological and pathological patterns may be found in sections from different areas of the same breast. These are often interpreted as stepping-stones to disaster, but presumably, could be tissue reactions to a varying chemical status.

London, W.1. F. D. SANER.

PNEUMOCONIOSIS

SIR,—Dr. Triger [1] has commented on the lack of comparisons of pneumoconiosis diagnoses during life with post-mortem findings, and Dr. Fletcher [2] has subsequently drawn attention to the observer error in pathological assessment.

This problem of comparing diagnoses intra vitam with post-mortem findings in silicosis has been repeatedly studied in Germany.

Worth and Nerreter [3] have analysed the data for 327 cases of silicosis confirmed by necropsy. The degree of silicosis was based on the older classification into stages I, II, and III.

In 83% of the cases there was agreement between clinical and post-mortem findings for the degree of silicosis found. Taking the necropsy findings as correct, the clinical results overestimated the disease in 8% of the cases and underestimated it in another 8%. The overestimates occurred chiefly in stages 0–II and the underestimates in stage III.

Although the German classification is not appropriate for pneumoconiosis in coalminers, and differs from the classification used in this country, a detailed survey here would probably also show reasonable general agreement between radiographic and pathological observations.

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Ministry of Fuel and Power,
Portobello Street,
Sheffield, 1. G. NAGELSCHMIDT.

RUPTURE OF DUODENAL STUMP AFTER GASTRECTOMY

SIR,—Mr. Henson's paper (March 19) draws attention to afferent-loop obstruction as a dangerous complication of a Polya partial gastrectomy. The successful result in his case emphasises the importance of his early and accurate diagnosis of this complication, which is gradually becoming more widely recognised.

With regard to his conclusions I would suggest that, in addition to careful clinical and radiological examinations, the gastric remnant should always be aspirated with a Ryle's tube, when afferent-loop obstruction is suspected. Absence of bile in the aspirations will confirm that the afferent loop is obstructed. This simple test can be performed in a few minutes in the ward, and may give useful results, particularly at times when the clinical signs are indefinite and radiological facilities are not immediately available.

Ilford, Essex. R. P. WARREN.

SIR,—I was interested to read Mr. Henson's article. Although I am not sure that a distended afferent loop per se will cause the blowing of a duodenal stump, I feel that it may contribute to this catastrophe. With an imperfect duodenal suture-line, afferent-loop distension could conceivably hasten the breakdown of the closure and add to the violence of the burst.

For four years I have been performing a Roux-en-Y anastomosis in the Polya type of gastrectomy for duodenal ulcer. This operation results in deviation of the afferent loop from the gastro-intestinal anastomosis, and is undertaken to prevent the post-gastrectomy syndrome. We stated that a point incidental to the Roux-en-Y type of anastomosis was that the duodenal contents pass uninterrupted into the jejunum, thus diminishing the risk of a blown duodenal stump.[1]

My experience with the Roux-en-Y anastomosis has been that, while a small number of minor duodenal leaks have been encountered (about the seventh day with little inconvenience to the patient), there have been no cases of catastrophic burst duodenal stump. This may prove an important advantage. My experience supports the claim that a distended afferent loop is an important factor in rupture of a duodenal stump.

Victoria Hospital,
Swindon, Wiltshire. J. EWART SCHOFIELD.

PERFORATED DUODENAL ULCER AND SLEEPING POSITION

SIR,—Few will dispute that hyperchlorhydria is an important factor in duodenal ulceration. The following investigation was suggested by the possibility that gastric and duodenal night secretions, collecting at the most dependent portion of that part of the gut, might there cause ulceration. The most dependent portion will, of course, vary with the patient's position; but changes of position are very much less at night, and so it seemed reasonable to expect some relationship between sleeping posture and the site of ulceration.

One obvious objection is that the lie of the stomach is very variable; for this reason gastric ulceration was ignored throughout the investigation. The position of the duodenum is also variable, but the differences are comparatively slight. The anterior surface of the first part of the duodenum nearly always passes transversely from left to right with a slight tilt superiorly and posteriorly. The digestive juices of the patient who sleeps on his belly will therefore bathe the anterior wall of his duodenum; and the juices of the patient who sleeps on his back will (though to a lesser extent because of the posterior tilt) bathe the posterior duodenal wall.

This hypothesis may be criticised on the grounds that the gut is not a flaccid gutter, that its walls are normally in apposition, and that stagnant puddles of secretion are therefore unlikely to form. Yet at laparotomy the duodenum is usually found to be uncollapsed, and peristalsis is less noticeable there than elsewhere in the small gut. More difficult to counter is the suggestion that people do not know in what position they sleep—they know only the position in which they *fall* asleep. During the night, if advertisements are to be believed, vast amounts of energy are expended in twisting and turning. Nevertheless, careful observations on sleeping hospital patients reveal that major movements involving complete change of posture are made, on the average, some three or four times only; and usually the patients revert quite soon to their "favourite" sleeping position. Most patients become more restless towards morning, but quite a number—particularly women—lie log-like all night in one position.

Sleeping posture varies considerably with age: the young sleep more often on their bellies than do the old, and more older people—perhaps because of fat bellies and less adaptable vertebral columns—sleep on their backs. Nevertheless, the most common position in all age-groups is on the right side. Slightly less common are those who sleep on their left sides. Comparatively few persons sleep on their backs, and even fewer sleep on their bellies.

100 patients who had had anteriorly perforated duodenal ulcers (confirmed at laparotomy) were first investigated. Those who had returned home were sent a questionnaire concerning their position during sleep, and the others were questioned verbally. Many were unable to make dogmatic statements, so the words "always," "usually," "sometimes," and "never" were used in estimating the frequency of the four positions (right side, left side, back, or belly). When allowances had been made for intermediate positions, the findings were as follows:—

Chiefly on the right side	45%
Chiefly on the left side	33%
Chiefly on the belly	None
Chiefly on the back	22%

The average age of these patients was 48.

1. Schofield, J. E., Anderson, P. St. G. *Brit. med. J.* 1953, ii, 598.

1. Triger, K. *Lancet*, 1954, i, 574.
2. Fletcher, C. M. *Ibid*, p. 626.
3. Worth, G., Nerreter, W. *Beitr. SilikForsch.* 1954, **30**, 3.

137 outpatients and inpatients, also of an average age of 48, but with no recognised abdominal troubles, were then similarly questioned, and the following results obtained:

Chiefly on the right side	44%
Chiefly on the left side	35%
Chiefly on the belly	9%
Chiefly on the back	12%

Contrary to expectations, the results showed that patients who had suffered anterior perforations slept less often on their bellies than those in the control group. There are two possible explanations for this: the duodenal contents may be satisfactorily buffered, even in those with hyperchlorhydria, by the duodenum's own alkaline secretion and by the lessened nocturnal biliary and pancreatic contributions; a more probable explanation is that patients with anterior duodenal ulcers find that lying prone is more uncomfortable than lying supine. 2 patients spontaneously admitted that, shortly before perforating, they had found that their pain was very much less if they turned on to their backs.

My thanks are due to Mr. Richard Charles and Mr. Arthur Hill for permission to interrogate their patients.

Ipswich. EDWARD ELMHIRST.

ARTIFICIAL POSITIVE-PRESSURE RESPIRATION

SIR,—When respiratory paralysis is associated with pharyngeal paralysis special precautions must be taken regarding artificial respiration. Brown et al.[1] emphasised the need for early tracheotomy; thereafter artificial respiration may be applied by means of a tank respirator [2] or by intermittent positive pressure (I.P.P.) through a short cuffed endotracheal tube inserted directly into the trachea.[3 4]

While some I.P.P. machines are designed to intermit the flow from a cylinder of compressed air or mixture of oxygen and nitrogen,[5 6] many others are designed to pump room-air rhythmically from a bellows [7 8]; and with these a pressure-operated (P.O.) inspiratory/expiratory valve must be used. This type of valve is used in the positive-pressure attachments with which many tank respirators are now being fitted.[9] In prolonged I.P.P. with a bellows-type machine, the air passes through breathing-tubes and a humidifier to the P.O. valve, then through a short piece of wide-bore rubber tubing to a suction connection attached to the cuffed endotracheal tube. The P.O. valve is of crucial importance, for it must respond promptly to the rhythmic alternation of inspiratory and expiratory pressures in the tubes, must seal accurately in either phase, must offer minimum airflow - resistance (especially to expiration), must never stick, must be robust, and must be easily cleaned and sterilised.

The P.O. valve described here was designed by one of us (G. T. S.-C.).

The valve (figs. 1 and 2) consists of an aluminium casing with three ports— inspiratory (A), expiratory (B), and inspiratory/expiratory (C)—and a diaphragm (D) of reinforced rubber. The casing is made in two parts which are held together by hinged clips similar to those used on the distributor head of a car. When assembled, the casing firmly grips the margin of the diaphragm. The diaphragm has a ring of six air-holes (E) and carries a thin centrally attached metal plate (F) and two studs which fit into corresponding notches in the casing to ensure correct positioning. With the diaphragm in neutral position a gap of $^1/_{32}$ in. separates it from a circular sealing rim (G) which surrounds the inner aspect of the inspiratory/expiratory port. By undoing the clips and opening the casing the diaphragm may be removed and a fresh one installed in a few seconds. The diaphragm and casing withstand sterilisation by boiling.

On inspiration air is forced through the six air-holes, simultaneously pushing the diaphragm against the sealing rim and the metal plate away from the air-holes. On expiration the diaphragm breaks away from the sealing rim and returns to its neutral position, impelled by suction from the expanding bellows on one side and by pressure from the recoiling lungs on the other, and aided by its own slight elasticity. The same forces seal the metal plate against the air-holes, compelling the expired air to pass through the single expiratory vent (to which a spirometer may be attached when desired).

The combined area of the air-holes and the area enclosed by the sealing rim determine the resistance of the valve to airflow—which is up to 10 cm. water-pressure in inspiration (varying with the condition of the diaphragm) and 2 cm. water-pressure in expiration. The $^1/_{32}$ in. excursion (H) of the diaphragm from the neutral position is crucial in valvular efficiency.

The casing offers no lodgment for water condensing from the expired air, provided the expiratory vent is inclined downwards to allow drainage. No sliding parts that might stick or wear are used in the construction of the valve.

Careful watching and frequent changing is necessary in the use of any P.O. valve, and a spare valve must always be at hand. The valve described here should be changed at least daily, although it has been found to function effectively for a few days without attention; occasionally it may be sufficient to change the diaphragm only. The application of negative

1. Brown, J. R., Baker, A. B., McQuarrie, I. *J. Amer. med. Ass.* 1947, **135**, 425.
2. Harris, H. H. *Arch. Otolaryng., Chicago*, 1952, **56**, 385.
3. Lassen, H. C. A. *Lancet*, 1953, i, 37.
4. Smith, A. C., Spalding, J. M. K., Russell, W. R. *Ibid*, 1954, i, 939.
5. Bang, C. *Ibid*, 1953, i, 723.
6. Macrae, J., McKendrick, G. D. W., Claremont, J. M., Sefton, E. M., Walley, R. V. *Ibid*, 1953, ii, 971.
7. Beaver, R. A. *Ibid*, 1953 i, 977.
8. Russell, W. R., Schuster, E. *Ibid*, 1953, ii, 707.
9. Galpine, J. F. *Ibid*, 1954, i, 1013.

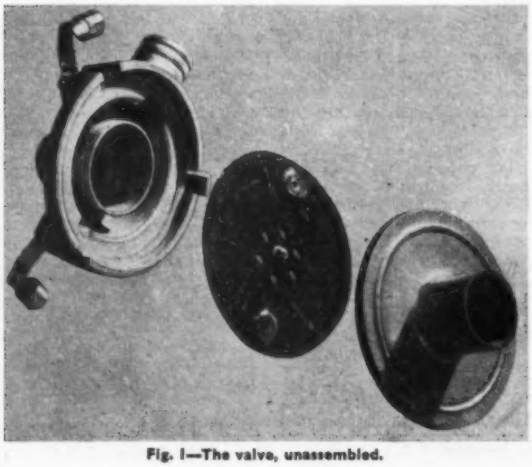

Fig. 1—The valve, unassembled.

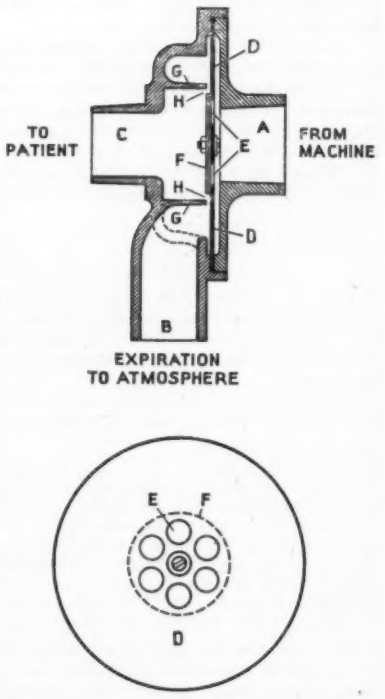

Fig. 2—Above, diagram of the valve. Below, diaphragm showing inspiration ports and plate valves (interrupted line).

pressure in expiration ("blow and suck") is advocated by Maloney et al.,[10] but with a P.O. valve of this type suction would interfere with closure in the expiratory position. In any case "blow and suck" action is not possible with the apparatus used at present in Britain. Future models will employ mechanically operated valves rather than P.O. valves; the former will operate effectively in either I.P.P. or "blow and suck" respiration, and will entirely remove the fear of valve failure.

APPARATUS FOR TESTING POSITIVE-PRESSURE EQUIPMENT

In assessing the efficiency of new apparatus it is necessary to measure function against a standard. Accordingly one of us (G. T. S.-C.) constructed a testing machine for I.P.P. equipment (fig. 3) in which a concertina-bellows acts as an artificial lung.

The relation (if any) of the expansile response of a patient's lung to the expansion of the bellows is not known, but the bellows works within the range of expected clinical pressures by expanding against a spring which, at a tidal volume of 920 ml., produces a pressure of 10 cm. of water. The expansion of the bellows is communicated through a simple lever system to a ball-point pen moving to and fro along parallel guides. The mounting allows the pen to rest solely by gravity on graph-paper, which is unrolled by clockwork at a constant speed. A seconds recorder (also with ball-point pen) works off an electric-clock mechanism. A gauge indicates the pressure (in centimetres of water) inside the bellows.

The inlet port of the machine will take a P.O. valve direct—corresponding to "mask" conditions—or will accommodate plastic tubes of two sizes, representing the male and female trachea respectively, into which cuffed endotracheal tubes can be inserted as in clinical practice in I.P.P.

The aim throughout has been to eliminate friction and jerkiness, and so abolish adventitious movements of the recording pen; the resultant curves are smooth and free from unexplained fluctuations. They relate directly to positive pressure and volume, but not to negative pressure, though the latter shows on the curve and can also be read on the gauge. The device gives constant results under the same conditions and thus can function as a reasonable standard. It has been indispensable in developing the P.O. valve described above, and has been used to compare the performance of a number of such valves and of I.P.P. machines. The tester may also be used to measure the effect on airflow resistance of varying the other components of an I.P.P. assembly—e.g., the size of endotracheal tube.

10. Maloney, J. V. jun., Elam, J. O., Hanford, S. W., Balla, G. A. Eastwood, D. W., Brown, E. S. *J. Amer. med. Ass.* 1953, **152**, 212.

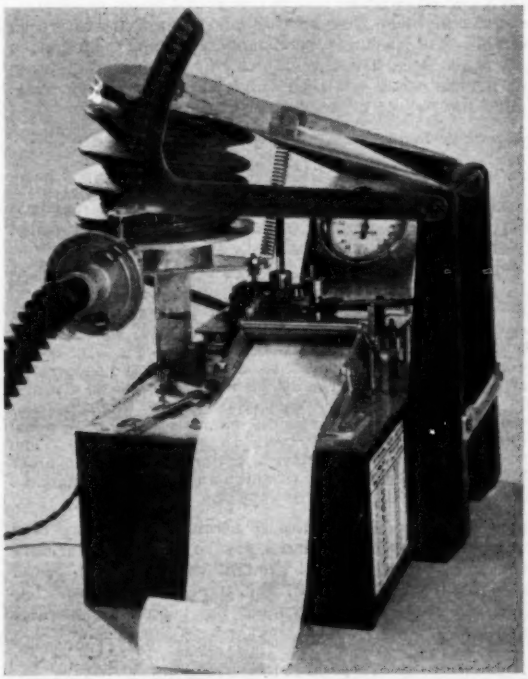

Fig. 3—Testing machine.

J. F. GALPINE
G. T. SMITH-CLARKE.

Coventry.

HYPERGLYCÆMIA AFTER BURNS

SIR,—It is some time since I discussed the occurrence of hyperglycæmia and glycosuria after burning injury with Dr. J. P. Bull and his colleagues at the M.R.C. Burns Unit in Birmingham. I was therefore very interested to read in Dr. Sevitt's letter (March 12) that he has found additional evidence of adrenocortical overactivity and also changes in the islets of Langerhans at post-mortem examination in such a case. Dr. Sevitt has misunderstood me in stating I suggested that early involvement of the islet cells did not take place. He is correct in presuming that the reducing substance in the urine of my patients was glucose, not lactose or galactose: incidentally, none of my patients were treated with lactose powder. Finally, I described the effect of a single dimercaprol injection on glucose tolerance in the burned cases as slight. However, to my colleagues and me, the implication of this, coupled with the more pronounced effects after several injections in some diabetics, is that replenishing or augmenting SH groups may alleviate faulty glucose metabolism in certain patients.

Medical Research Council
Clinical Research Unit,
Guy's Hospital, London, S.E.1. W. J. H. BUTTERFIELD.

EFFECTIVE CIRCULATION OF UTERINE WALL IN LATE PREGNANCY

SIR,—Dr. Schuurmans (March 26), in accounting for the efficiency of anti-histamine treatment in pregnancy toxæmia, has advanced hypotheses which much evidence refutes.

He assumes that permeability of the maternal capillaries exists in pre-eclampsia to account for the œdema. This cannot be the case, for the protein in œdema fluid amounts to 0·10–0·48 g. per 100 ml.—a level insufficient to overcome the osmotic pressure and attract fluid out of the vessel wall.[1–4]

Nor can adrenaline or noradrenaline be invoked in the causation of hypertension, for it has been shown by Assali [5] that benzodiozane effective in producing adrenergic blockade was without effect on the blood-pressure in normal or toxæmic pregnancy. Corticoids, too, cannot be of primary ætiological significance [6] since their function appears to be regulatory. Further the level of the lipid-soluble substance in the urine, a reflection of the corticoid content of the blood, does not correspond with the severity of the toxæmic state,[7] and therefore is not consonant with the ætiological importance of corticoids—a fact confirmed by the failure to provoke toxæmia in pregnancies other than the first. Contrary also to Dr. Schuurmans's contention, evidence has accumulated in recent years to show that histaminase activity is unchanged [8] or is even considerably reduced in pre-eclamptic toxæmia.[9 10]

There would, however, appear to be another explanation for the therapeutic effect of anti-histamines, based on their effect in overcoming renal spasm. Chatterjee [11] has administered these substances in resistant cases of

1. Dexter, L., Weiss, S. Pre-eclamptic and Eclamptic Toxæmia of Pregnancy. Boston, 1941.
2. Stead, E. A. jun., Warren, J. V. *J. clin. Invest.* 1944, **23**, 283.
3. Switzer, P. K., et al. *Amer. J. Obstet. Gynec.* 1950, **60**, 427.
4. Helmuth, K., Albano, J. Cited by Switzer et al. (footnote 3).
5. Assali, N. S., Pyrtskowsky, H. *Surg. Gynec. Obstet.* 1950, **90**, 655.
6. Sophian, J. *J. Obst. Gynæc., Brit. Emp.* 1955, **62**, 42.
7. Venning, E. H., Singer, B., Simpson, G. A. *Amer. J. Obstet. Gynec.* 1954, **67**, 542.
8. Gabwray, B., Anrep, G. V., Barsoum, C. S. *Int. physiol. Cong., Copenhagen*, 1950, p. 212.
9. Kapeller-Adler, R. *Ibid*, p. 289.
10. Kapeller-Adler, R. Ciba Foundation Symposium on Toxæmia. London, 1949.
11. Chatterjee, H. N. *Lancet*, 1952, ii, 90.

anuria, the sequel of severe cholera, with remarkable success. Here the only possible explanation for their effectiveness was that they overcame the basic renal ischæmia responsible for the renal failure. It would be reasonable to conclude that Dr. Schuurmans's success is similarly explained; for I have shown [6] that such a renal state, provoked by the resistance to stretch of the myometrium, underlies the toxæmic process.

London, W.1. JOHN SOPHIAN.

THE PSYCHIATRIC DAY-HOSPITAL

SIR,—In your annotation of Feb. 26 the reference to the paper from Bristol on this subject should read, not Aron, K. W., but Aron, K. W., and Smith, S. The Bristol day-hospital experiment was initiated, and is still being conducted, under the general supervision of Dr. Smith.

Ayr. K. W. ARON.

INFECTION WITH CRYPTOCOCCUS NEOFORMANS

SIR,—In the absence from this country of Dr. Beck, and as the one associated with him in case 1 of our article (March 12), may I reply to Dr. Michaels (March 19)?

I think that he is interpreting too rigidly the phrase "revealed the true nature of the illness." He will no doubt have noticed that in our discussion we referred to the *association* between cryptococcosis and Hodgkin-like lesions, and that we had also considered that in these cases the explanation might lie in an alteration of certain immunity mechanisms. However, the statistics of the series we cited suggested that the explanation may not be quite so simple as that and it was this thought we had in mind.

I have had the opportunity of seeing a section of a lymphatic gland which showed cryptococci in typical Hodgkin tissue; this gland had been removed in the early stages of generalised lymphadenopathy.

In our case 1 the cryptococci were present in large numbers in the sample of cerebrospinal fluid taken on admission before any antibiotics had been given. I believe, too, that Dr. Michaels will find that a large proportion of the cases in the series reviewed by the authors we mentioned occurred before the days of antibiotics.

Morbid Anatomy Laboratory,
St. Margaret's Hospital,
Epping, Essex. I. M. TUCK.

B.C.G. VACCINATION

SIR,—Dr. Webster (March 5) asks very pertinent questions regarding this prophylactic measure and quotes Prof. Heaf (Feb. 12): "statistical proof is difficult to obtain." May I give my views on some of these points in the light of tuberculin-sensitivity surveys of the school-children in Lewis in 1949 and 1954 and the administration of B.C.G. vaccine.

I was extremely keen on pressing on with administering B.C.G. to every tuberculin-negative person—young or old—whom I could discover, because of the exceptionally high mortality-rate (1948, 176 per 100,000; 1954, 76) and the sustained high notification-rate with 50% of all notified cases yielding positive sputum, and the abnormally high infection-rate among school entrants (5–6 years) of 18%. A high positive-reactor rate in this group must surely imply many infectious cases in the population, and a falling-off of this rate likewise must indicate a diminution of these. Such a fall was observed on a second tuberculin-sensitivity survey in 1954, when the rate was down to 2·7% for entrants. In view of this I concluded that there did not seem the same need to push B.C.G. The death-rate fell to about 12 per 100,000 in 1954.

This glorious result could not be attributed to B.C.G.—it was a natural fall consequent on improved social conditions and better treatment of infectious cases. However, closer study of the figures (March 19, p. 620) suggested that the higher the positive-reactor rate in any area the lower the mortality, seeming to indicate that immunity is related to allergy. Again allergy as produced by B.C.G. appears to give enhanced resistance. By September, 1954, of 3000 vaccinated (the majority three or four years previously) none had been notified as tuberculous whereas of 1188 positive reactors in 1949 29 had been notified, and of 2814 negatives 9 had been likewise notified, and since September, 1954, several more positive and negative reactors have been affected, some requiring sanatorium treatment. In view of this I have now once again instituted a vigorous B.C.G. campaign.

With regard to unpleasant consequences I have had only 3 cases of axillary adenitis with abscess. Because of the long time necessary for healing of the usual ulcer I have gone in for vaccination by multiple puncture after concentrating the vaccine as supplied, by centrifuging and discarding 50–80% of the supernatant fluid (I am endeavouring to find the most suitable concentration). The subsequent local reaction, which appears in from seven days onwards, is slight, has had no undesirable side-effects; there is no ulceration or scarring, and the skin over the vaccination area simply desquamates. In 50 cases so vaccinated the "take" has been 100%, and the conversion-rate has been 100% also. The conversion-time is much shorter than by intradermal injection. The perfection of this technique would mean enormous advantages and would allow mass B.C.G. vaccination to be undertaken with ease by school medical officers and general practitioners. With Heaf multiple-puncture apparatus a single test only is necessary. Where local authorities provide segregation homes the shorter conversion-time would mean a considerable saving. For this multiple-puncture technique I would suggest that a suitably concentrated vaccine should be put up in single doses in capillary tubes as is done with calf-lymph.

Dr. Loxton (March 19) mentions desensitisation by artificial means. I have scores of children reverting to negative (to 100 T.U.) naturally, and over a score who showed radiological evidence of infection and yet have lost their hypersensitivity to 100 T.U. When B.C.G. was administered to some of these they once again became positive. Again, some B.C.G. reverters after three years were revaccinated by multiple puncture, and the local and allergic reaction appeared simultaneously in less than seven days. How does this fit in with Godlowski's enzymatic hypothesis?

I am convinced that B.C.G. confers immunity of a high degree. No special precautions regarding segregation were taken here, and the majority of vaccinated children live in the areas with the high sputum-positive rate. should like to see all babies given B.C.G. at birth.

Stornoway, Lewis. R. STEVENSON DOIG.

THE ACTION OF CHLORPROMAZINE

SIR,—I have read Dr. Buxton Hopkin's account (March 19) of the French work dealing with the so-called "phenomena of Reilly" with bewilderment.

These effects, we are told, follow "irritation as opposed to either simple section or stimulation of sympathetic nerves"; they are produced by "perisplanchnic injections of different substances," and, "physical agents—e.g., trauma and electrical stimulation." The condition is rapidly fatal and is accompanied by widespread lesions, including hæmorrhage and necrosis of the suprarenal glands as a constant feature. The "irritation" of the splanchnic nerves produces conspicuous changes in the cerebral circulation. "Pathogenic impulses" pass from the brain to the periphery. "The effects are produced by placing irritants in direct contact with or in close proximity to autonomic nerves in amounts which would be innocuous by injection elsewhere."

The results described are so strange and unexpected and the explanations offered are so much at variance with current physiological thought that I for one prefer to suspend judgment until this experimental work has been repeated and confirmed by reputable workers elsewhere.

Department of Physiology,
Middlesex Hospital Medical School,
London, W.1. SAMSON WRIGHT.

MASKED EPILEPSY

SIR,—Some children have periodic attacks of headache, or abdominal pain, or vomiting, or limb pains, or fever, and these five symptoms may be grouped together as the recurrent syndrome. Dr. Wallis (Jan. 8) suggests that many, perhaps all, of these children may have epilepsy. I agree with Professor Illingworth (March 26) that it would indeed be a tragedy if all of this large group of children were deemed to be epileptics, and I doubt very much whether it is true. From clinical experience I am satisfied that each of the five symptoms can be the bodily manifestation of a tension state, and the common factor to them all is tension. Recurrent abdominal pain in children, for example, fulfils the criteria of a stress disorder,[1] and it usually clears up after measures have been applied to relieve the tension. Giving phenobarbitone, which Dr. Wallis recommends, is one such measure, but this is a palliative treatment only. Thorough treatment involves exploration of the child's mental state and his home environment; this takes time, but the time is well spent, because after treatment the child and his mother are better adapted to their lives and more content.

London, W.1. DESMOND O'NEILL.

SIR,—When a new idea appears one can either disbelieve it or try it out. I have heard of a famous surgeon who was wont to raise a laugh in the operating-theatre by saying: "Close the door, sister; we don't want one of Mr. Lister's germs to creep in." The laugh is now (to mix metaphors) on the other foot.

Professor Illingworth prefers disbelief to experiment; but the letter, in the same issue, from Dr. Ulutin, shows that experiment is more rewarding. I will not attempt to answer all the points raised by Professor Illingworth. Most of them have been dealt with in my paper.

For instance, he says that attacks of fever are not manifestations of epilepsy, whereas in my description of case 2 I showed that the child was in hospital suffering from an unrelated disease, and the attacks of fever and vomiting were observed by competent clinicians but could not be explained. He has also neglected the experience of Davidson and Lombroso which I cited.

I should, however, like to comment on three-month colic.

Professor Illingworth says: "I can see not the slightest connection or resemblance between three-month colic and epilepsy." After reading his exhaustive paper on the subject,[2] one is driven to the conclusion that no-one knows the cause of this malady. But there are several clues to its nature: first, the experience of Sir Frederic Still and Dr. W. Sheldon, cited by Professor Illingworth, that in some cases the condition leads on to convulsions; second, the comment[3] that the disease is apt to run in families and may be linked with a particular kind of temperament; third the experience of Dr. Millichap, who states (Feb. 19) that some of his patients with cyclical vomiting had had colic in infancy.

I can think of four ways in which this hypothesis might be tested: first, to inquire into the family history of those children who suffer from three-month colic; second, to take electro-encephalograms from them; third, to try the effect of anticonvulsant drugs; and fourth, to follow them into later life and see if they do develop convulsions. The first three methods have not been tried as far as I know. Until Professor Illingworth has used them I must consider his dogmatism unjustified. The fourth seems promising in view of the work of Still, Sheldon, and Millichap.

As to the mode of onset, I know that Sir William Gowers liked to hear of a sudden onset before making a diagnosis of epilepsy. But, as someone has written, he spoke without benefit of electro-encephalography. No doubt he would now be the first to admit that the sort of cases he described in *The Borderland of Epilepsy* should really be included within the limits of that disorder.

Some may think that we are arguing about something that does not matter—i.e., a name. I feel very strongly that it is important that these conditions should be recognised and *treated*. Children still die from cyclical vomiting.[4] Now that the nature of the condition is known there is no excuse for this to happen.

Professor Illingworth complains that hospitals will be inundated with requests to investigate obscure pains, vomiting, and fevers. Surely the more such cases that are investigated the better.

Bath. HUGH R. E. WALLIS.

1. Mac Keith, R., O'Neill, D. *Lancet*, 1951, ii, 278.
2. *Arch. Dis. Childh.* 1954, **29**, 165.
3. Annotation, *Brit. med. J.* Jan. 8, 1955, p. 93.

STERILISATION OF SYRINGES

SIR,—About five years ago I gave up wrapping syringes in lint or gauze before boiling them, for I found I could do so without the glass breaking. It may be that the holes in the tray of my steriliser are of the right size (they are about $^1/_4$ in. in diameter), but I believe this is a very usual size in sterilisers. My original reason for abandoning lint was because I disliked unwrapping syringes with a hot wet compress round them—particularly when in a hurry. At the present price of lint and gauze their omission saves money as well as time.

Manchester, 16. S. SHUBSACHS.

PERIODICALS FOR OVERSEAS

Mr. Mark Gibbs, senior history master at the Grammar School, Audenshaw, Lancashire, writes: "Very many students in overseas schools and colleges would welcome second-hand copies of THE LANCET and similar journals, which they are unable to afford for themselves. The senior boys of this school (already operating a periodicals scheme for refugees) are therefore starting a posting scheme to be known as Periodicals for Overseas. We already have the addresses of some 40 colleges which have asked for supplies, and we can provide helpers with ready-addressed labels and simple instructions for posting. Further details will gladly be sent on request. Journals should *not* be sent to Audenshaw."

Parliament

Genetic Effects of Nuclear Explosions

ON March 22 Dr. EDITH SUMMERSKILL asked the House of Commons to consider the long-term and remote effects of continuing nuclear explosions and the dangers of continuing radioactive contamination of the world's atmosphere, particularly to future generations. Scientific investigations in this field must necessarily be limited, but we would, she held, be irresponsible to ignore the reports that had been made. To date there had been 65 nuclear explosions—50 by the Americans, 12 by the Russians, and 3 by the British—and scientists were now expressing the opinion that these explosions could not continue without the danger of serious damage to health.

The professor of biophysics in the medical school of Osaka University, in Japan, had reported in people exposed to the Bikini test explosion of March, 1954, serious injury to the blood-forming organs and the reproductive organs. Undisputed evidence showed that a pregnant woman, exposed to only a moderate dose of radiation, ran the risk of aborting or giving birth to a stillborn child.

The Federation of American Scientists, she continued, had suggested that the United Nations should appoint a commission to explore the dangers of continued nuclear explosions. Mr. Strauss, the chairman of the Atomic Energy Commission of the United States, had reported that the fall-out from the hydrogen bomb could contaminate an area of 7000 square miles with lethally radioactive material. In this country Lord Adrian had

4. Brown, R. J. K. *Ibid*, 1954, ii, 1033.

said that the hydrogen bomb might "lead to a degree of radioactivity which no-one can tolerate or escape and thus end the human race."

Mr. IAIN MACLEOD, who stressed that he spoke on behalf of the Government, agreed that this problem offered a personal challenge to everyone which could not be shuffled off on to our leaders, on to our leader-writers, or on to the scientists. Turning to steps already taken, he said that the Medical Research Council had had committees considering the subject for eight or ten years. Represented on these committees, which were not Government bodies, were leading authorities from the universities, from the M.R.C. research staff, and from the atomic energy authorities.

There was nothing new in human beings being exposed to radioactivity. We, and our ancestors, and all our evolutionary predecessors, he pointed out, had been exposed to radioactivity from outer space. Each of us absorbed natural radiation of about 0·1 röntgen each year. According to the U.S. Atomic Energy Commission the total amount of radiation received by residents in the United States from all nuclear detonations was about 0·1 röntgen. Our calculations, derived from the Atomic Energy Authority, showed that the figure for somebody in this country would be about 0·03 röntgen. This figure was based on the improbable assumption that a man stands outside in the open for 24 hours a day for about 50 years. The effective average dose would in fact be considerably less. Indeed, at the present levels of irradiation it seemed improbable that we had anything more than an interesting basic scientific problem and a situation which must be watched very carefully indeed.

The real question, of course, was what was the threshold of radioactivity (which, if we are not there yet, we may reach in the future) beyond which man's genetic constitution might stand at risk. The dose of radiation accepted as a maximum level for workers on radio-isotopes or for radiologists was 0·3 röntgen per week, or, taking working hours and holidays into account, about 15 röntgen a year. That was enormously greater, of course, than any of the figures which the House had been discussing, but where large numbers of the community had to be considered the number of genes at risk was enormously increased, and therefore the number of matings which might be harmful was also increased. He had tried to find a figure at which danger would begin, but the more he went into the subject the more he found that the scientists disagreed. Estimates of the dose of radiation over a generation that was likely to double the spontaneous mutation-rate had varied from 3 röntgen to 300 röntgen. He was told that 50 röntgen over 25 years was as good a guess as could be made. The increase in the United States of America had only been a tiny fraction of this, and in this country it had been still smaller.

The United States Atomic Casualty Commission had been studying the population in the vicinity of atomic explosions during the late war. There was evidence that some conditions had a higher incidence among these populations, but no statistically significant evidence of genetic damage. Studies of people such as radiologists and patients who for therapeutic reasons had to have considerable doses of radiation had not shown any evidence of genetic damage. DR. BARNETT STROSS interposed that an American study of women treated with radiation for menorrhagia showed that among them the incidence of children born with congenital heart-disease and dislocation of the hip and clubfoot had increased.

In this country, Mr. MACLEOD continued, research was proceeding under the auspices of the M.R.C. in the research unit at Harwell, and there were other research institutions at Hammersmith Hospital and Leeds. The work was also being supported in many university departments. For the M.R.C.'s work in their own establishments on all aspects of the effects of radiation £208,000 was allocated in the provisional estimates for 1955–56. If the council found that an increase was essential, this would have the favourable consideration of the Chancellor of the Exchequer.

The Problem of the Aged

In the House of Lords on March 23, Lord BEVERIDGE suggested that many of the social and human problems of the aged were due to the fact that though the decay of our faculties was inevitable, the rate at which it came was uncertain. The change in the age-structure of the population also created difficulties. In 1951 we had 6,750,000 people of pensionable age, and about the same number of working age, and fewer than 6 million children. By 1979 there would be 9,500,000 people of pensionable age and there would still be about the same number of people of working age. The Chancellor of the Exchequer would have to find something like £500 million a year for pensions over and above what was paid by national insurance.

But the problem, he maintained, was not mainly one of money. The economic and social problems of the aged could not be solved by simply handing money to the pensioners. Besides pensions old people needed care of many and different kinds—care of a perpetually changing amount and character, ranging from the care needed by those chronically sick in hospital, through occasional medical and nursing treatment, to perhaps no care at all. The natural agent for giving care to old people was the family, but owing to the change in the population structure the family today was not physically able to do as much as formerly.

The aim should be to keep the elderly in their own homes, but if this was to be done there should be adequate machinery for discovering the growing failure of strength which made transfer to a hospital, or other treatment, necessary to avoid human tragedy. The National Assistance Board did its work well, but it had only 1,250,000 old people on its books and there were 7 million elderly people. In each neighbourhood there should be someone to whom neighbours could report an old person in need of more care. At present something like 1 million elderly people were living by themselves, and old people trying to live in their own homes should have adequate help. The present provision of home helps—30,000, of whom 3000 were full-time and 26,000 part-time workers—was ludicrously small.

There must also be some half-way houses between the hospital providing full treatment and the home. Local authorities were empowered under the National Health Service Act to establish these homes, and the powers had been largely used. A number of local authorities had also lately asked the Ministry of Health for permission to provide a chiropody service as part of the N.H.S., but the Government had replied that they had other, and greater, priorities for the health service. In Lord Beveridge's view the £14 million subsidy to cheapen tobacco for all pensioners, many of whom were women, could be more usefully spent on providing home helps and chiropody.

Lord AMULREE, returning to the problem of finding out in time when an old person is in need of care and help, said that the London borough where he worked had a population of 140,000. During the last six months roughly 200 old-age pensioners of sixty to sixty-five had applied for admission to hospital. 90 of them lived alone, and of these 40 were living in a state of dirt and squalor. Most of them were so neglected that they needed a lot of good food and tidying and cleaning up. The tragic thing was that in six months in one London borough 40 people were living in such conditions. What an enormous reservoir of human misery must exist in the rest of the country.

The EARL OF SELKIRK, replying to the debate, said that old people should be enabled to remain at work as long as possible, to remain in their own homes, and never to feel that they had ceased to be part of the community. The home-nursing service was still expanding; the number of nurses employed had risen from 7700 in 1948 to 9500 in 1953, and the number of cases attended had increased by about 40%. He agreed that the number of home helps was only 30,000, but in 1948 it had been only 11,000. There were also sitters-in and night watchers provided by some local authorities and voluntary organisations. The money spent on tobacco

was an example of the unsatisfactory result of making benefits available by coupon, but in practice it was difficult to withdraw concessions. Chiropody was available in hospitals and in some clinics, and home treatment could be provided under the National Assistance Act, but he agreed that the service was inadequate. An automatic method of discovering people who were in hardship was difficult to visualise. Surely this was a matter in which anyone, whether it be a neighbour, a general practitioner, or even a rent collector, could act by reporting the circumstances either to the local council or to the National Assistance Board. He thought that more was being done in the way of coördination of services than was generally appreciated. He believed that it was hoped shortly to institute meetings between medical officers of health and general practitioners. Local authorities in England and Wales had provided 69,000 beds, of which at least 50,000 were available for aged persons. Since the end of the war some 800 new small homes with accommodation for 23,000 people had been opened by local authorities. There were registered over 1200 small homes with another 23,000 beds. He felt that whatever action we took it was essential that old people should remain useful, independent, and wanted; this objective depended as much on each citizen as on the State.

QUESTION TIME

Tuberculous Patients in Swiss Sanatoria

Replying to a question, Mr. MACLEOD said that the Ministry of Health began to send patients to Davos in the autumn of 1951, when waiting-lists for tuberculosis beds in England and Wales stood at over 7000. The provisional figure for the end of 1954 was 2500, and this of course included a large number of patients who were on the point of being admitted at once. Several hospital regions now had virtually no waiting-list. Some were closing tuberculosis beds or turning them over to other purposes. Well over 900 patients from England and Wales had been sent to Switzerland by the National Health Service, and this had been a most valuable contribution to the work against respiratory tuberculosis. But taking into account the diminished pressure today on tuberculosis beds at home and the recent difficulty in finding enough suitable patients willing to go to Switzerland for treatment, he was satisfied that there was no necessity to extend the scheme beyond this autumn, when the contracts with the sanatoria expired. Suitable arrangements would be made for winding it up so as not to discharge patients from the sanatoria in Davos before they were fit.

Commander T. D. GALBRAITH, in a statement on the Scottish scheme, said that over 900 patients from Scotland had gone to Switzerland. During the past twelve months the total waiting-list had fallen from just under 2000 to around 500. Chest physicians were finding it increasingly difficult to fill the beds in Switzerland. Patients were now coming forward from four areas only—Glasgow, Renfrewshire, Dunbartonshire, and Stirlingshire. They could not usefully send any more patients to the Sanatorium Wolfgang, where they had had the use of 70 beds. For the present they were continuing to send patients to the Sanatorium du Mont Blanc, where they had the use of 120 beds, which would be sufficient to accommodate all the patients coming forward under the scheme. If present trends continued the time might not be far distant when it would be possible, without prejudice to the treatment of Scottish patients to reduce still further the scale of these arrangements, and eventually to terminate them altogether.

Counteraction of Nuclear Explosion Effects

Replying to a question, Mr. HAROLD MACMILLAN, Minister of Defence, said that experiments had been started under the authority of the Minister of Supply to test the uses of smoke in counteracting the effects of nuclear and thermonuclear explosions. The results would be of interest both to Civil Defence and to the Services.

Conservative Dental Work in Scotland

Replying to a question, Commander GALBRAITH said that the number of courses of dental treatment, other than emergency extractions and the supply of dentures, in Scotland increased from 603,000 in 1951 to 715,000 in 1954. Most of these courses were for conservative work.

Obituary

HENRY MARRIAN JOSEPH PERRY

C.B., O.B.E., F.R.C.P., L.R.C.P.I.

Major-General Marrian Perry, director of pathology at the War Office in the early part of the late war, died on March 23, at his home at Walton-on-Thames, at the age of 71.

Son of the late John Perry, he was educated at Queen's College, Cork, and joined the Royal Army Medical Corps soon after qualifying in 1906. In the 1914–18 war he was a regimental medical officer, commanded a field ambulance, and became assistant adviser in pathology in France. In 1918 his experience of agglutination tests for enteric infection in men inoculated with T.A.B. vaccine was described in a long paper in our columns, with a note by Sir William Leishman. Meanwhile he had investigated with Captain (now Sir Henry) Tidy an epidemic of aertrycke infection at a depot, and their account of this was one of the early "special reports" of the Medical Research Committee. His bacteriological work continued with contributions on bacillary dysentery, on the antigenic properties of "Bacillus psittacosis," on leishmaniasis, and on the flocculation test in syphilis. Some of it was done as assistant professor, and later professor, of pathology at the Royal Army Medical College; but in 1926 he was seconded from Millbank to work for four years as director of the public-health laboratories in Cairo. To this period belongs the essay on the practical diagnosis of typhoid and paratyphoid infections which he and H. J. Bensted wrote for the Medical Research Council's *System of Bacteriology* (1929).

Returning to pathology at Millbank, Perry was appointed honorary surgeon to the King in 1933, and reached the rank of major-general in 1935. As Director of Pathology at the War Office he was chairman of the Army Pathology Advisory Committee and also a member of the Chemical Defence Committee. From these posts he retired in 1941.

"Marrian Perry will always be remembered as a brilliant teacher by all officers who attended his lectures at the Royal Army Medical College," writes L. T. P.

"One of his many gifts was his extraordinary command of English which always fascinated his students and at times delighted them by the artistic way he would round off his sentences. His enthusiasm for his subject, and the energy he displayed, never failed to inspire. He was quick, dapper, and courteous, and, as he entered the lecture theatre—always immaculately dressed—his commanding presence immediately arrested attention. He would take great care to make his subject interesting and to relate it to other branches of medicine. An hour's lecture would slip away into what seemed like moments. He had the gift of displaying facts in a simple way—always the mark of a good teacher.

"In his capacity as Director of Pathology he was exemplary in the high standard he set. He lived for his subject and for the health of the Army and would go to endless trouble to further research. The team spirit in his department was indeed high, for he inspired confidence and was sympathetic and approachable. Those who specialised in pathology under his guidance have cause to be grateful for the help and encouragement he gave them. Among his colleagues in all branches of medicine he was held in high esteem and his opinion was sought on many problems. His judgment was sound; this had the effect not only of enhancing his own reputation but also that of his department. In the mess he was the best of company and with his quick repartee a most entertaining after-dinner speaker. His many accomplishments and his wisdom made him a unique personality in the Corps. The name of Perry will always be linked with the highest traditions of pathology in the Army."

General Perry was appointed O.B.E. in 1919 and C.B. in 1937, and in 1941 he was elected F.R.C.P. He married in 1912 a daughter of the late E. G. Brewer.

AGNES CATHARINE SCOTT

C.B.E., M.B. Lond.

Dr. Agnes Scott, who died in London on March 22, had given many years of life and valuable service to India as chief medical officer of the Women's Medical Service.

She was born in 1875, the second daughter of Canon John Scott of Leeds, and went to school at the Leeds Girls' High School and Yorkshire College. She studied medicine at the London School of Medicine for Women and qualified in 1901. She had entered the medical profession with the definite idea of serving as a missionary in India, and she went out to that country in 1903 to serve with the Cambridge Mission to Delhi. Her first years were spent in Karnal, a small station in the South Punjab, and afterwards she was moved to Delhi. Both experiences were valuable to her in her later work since one was a rural area and the other an urban one. The hospital in Delhi was at first in the middle of the old city, but during Dr. Scott's time it was moved to the "Civil Lines" where there was more air and space. The experience of helping to build a new hospital was also valuable for her subsequent work.

In 1917 a partial breakdown in health led her to accept the post of assistant to the inspector-general of civil hospitals in the Punjab. This post had been created only a few years before and was first held by Dr. M. I. Balfour, whom in 1924 Dr. Scott again succeeded as chief medical officer of the Women's Medical Service. In 1925 she was awarded the Kaiser-i-Hind gold medal, and in 1932 when she retired she was appointed C.B.E.

R. Y. writes: "Dr. Scott's gifts were essentially practical. In the Punjab she was interested in the building and equipment of small hospitals in rural areas as well as encouraging existing mission and government hospitals in larger centres. She also did much to improve the practice of midwifery in rural areas by encouraging the training of the Indian midwives and the creation of assistant nurse midwives who were capable of simple nursing and midwifery.

"She showed the same gifts when she became head of the Women's Medical Service. It was a time of change and development in India, and medical women shared in both. Dr. Scott realised that the service would ultimately be an Indian one and she was anxious that those who entered it should be well qualified for their responsibilities. She also grasped the need for specialisation among some members of the service, particularly those who might become members of the teaching staff of the Lady Hardinge Medical College. For this purpose she created the 'training reserve' of the service by which promising graduates of Indian medical colleges could be sent abroad on scholarships. She was interested in all forms of health work and she fostered their development. Her devotion to high standards in professional work and her personal integrity were an outstanding example to members of the service.

"Dr. Scott was a keen churchwoman, and after her retirement she gave much time to the work of medical missions. Her wide experience made this a valuable piece of service. By nature she was reserved and not easy to know, but her occasional hot temper was a human touch which was accompanied by a sense of humour and a love of dogs. Behind her reserve was a warm heart which showed itself in many kind thoughts and actions and in real devotion to her friends and to the Church."

FREDERICK HECTOR SCOTSON

M.B. Manc. and Lond., F.R.C.S.

Mr. Scotson, consulting surgeon to the Crumpsall Hospital, and Northern Hospital, Manchester, died on March 23 at the age of 55.

He was born in Manchester, where his father was a well-known general practitioner, and he was educated at the Grammar School and the university where he won prizes and distinctions. He continued his medical training at St. Bartholomew's Hospital, and in 1922 took his London and Manchester degrees, the latter with honours. He took his F.R.C.S. at the age of 24, but he had to wait a year for his diploma on account of his youth. He held the usual resident posts at the Manchester Royal Infirmary, where he was a notably successful resident surgical officer.

He visited the Mayo and other American surgical clinics before he started consultant practice in 1929. He was soon appointed to the staffs of the Crumpsall, the Manchester Northern, and the Manchester Victoria Memorial Jewish Hospitals, and he helped to establish St. Joseph's Hospital, a big Catholic charitable nursing-home. He was also a lecturer in surgery at the university. As a general surgeon he had a busy life, but he found time for specialised interests. His early writings on genito-urinary surgery included papers on malignant tumours of the kidney and testicle. More recently he had turned to the surgery of the gastro-intestinal tract, and he was due to give an account of his experience in the treatment of peptic ulcer as his presidential address to the section of surgery of the Manchester Medical Society.

W. B., writing of Scotson's early days, recalls how "during his term as R.S.O. he succeeded in breaking the rule against marriage, a cleverly handled and notable triumph. Later in the few respites he could snatch from his work he loved a holiday where he could ski or bathe in sunshine. He was a good swimmer, having won his colours at the university, and continued to take active interest in the university swimming club. He was a keen golfer and tennis player. There can be little doubt that the energy he put into his surgical work brought on the illness which had troubled him in the last nine months."

Mr. Scotson leaves a widow and four children, the eldest of whom is a medical student.

RONALD GREAVES LADKIN

M.B.E., M.A., B.M. Oxfd, D.P.H.

Dr. R. G. Ladkin, senior medical officer in charge of health education in the Uganda medical department, died at Kampala on March 14, at the age of 35, from poliomyelitis.

Educated at Kingsbridge Grammar School and Exeter College, where he was Stapledon scholar and Devon scholar, he graduated in medicine at Oxford in 1942, and was house-physician at the Radcliffe Infirmary. He joined the Uganda medical department as a medical officer in 1943, and after serving in several districts became lecturer in anatomy at the medical school of Makerere College, Kampala. At Mulago Hospital he undertook genito-urinary surgery and thus became interested in venereal diseases. Of these he made a special study, and after taking his D.P.H. in 1948 he visited Trinidad to see methods of prevention and treatment in that area. On his return to Uganda he became medical officer of the rapidly advancing Mengo district and was soon promoted to be in charge of the province of Buganda.

It was in these country districts that he showed exceptional talent and industry, throwing himself with great energy and understanding into many measures of public health. He developed quite new approaches to the problem of rural health in tropical Africa: health weeks and large demonstrations along novel lines were held at many centres. His achievements in this field won him appointment as M.B.E., and a new post was created for him at medical headquarters, Entebbe. Both within and outside the territory he was in much demand, for he had a knack of combining the latest methods of visual education with a close knowledge of the African countryside and the psychology of the peasant farmers. He had built up a unique collection of films, posters, and booklets, and he received grants from international organisations to promote the work of health education.

A colleague writes of his "endearing personality which attracted his associates and won a place of real affection among the many Africans whom he served so generously. He saw more clearly than most the factors responsible for disease and malnutrition in Africa. He was essentially creative in all his work, full of good spirits, counting nothing of the financial stringency and other exacting conditions under which he worked. He seemed to take a special delight in long spells as a fast bowler under the tropical sun and in himself carrying parts of the huts that were assembled to accommodate climbers on the upper slopes of Mount Ruwenzori. He revelled in difficulties, not only those considered spectacular but those which were more prosaic. For instance, the success of the Red Cross blood-transfusion service in Kampala owes a great deal to his skilful propaganda in spite of much superstition among those Africans whom he was endeavouring to help. He felt that health education,

which consists in changing the minds of people, would always be a difficult affair."

Dr. Ladkin married Miss Heloise Carter, a nursing sister of the Uganda medical department, and there are three children.

Medicine and the Law

Air Embolism during Artificial Pneumoperitoneum

AT an inquest on a woman of 23 who died during the course of an artificial pneumoperitoneum injection for pulmonary tuberculosis, the cause of death was stated to be air embolism from accidental injection of the air into a vein. The operation had been carried out in a chest clinic by a doctor with wide experience of the procedure. A consultant chest physician said that in his opinion the doctor had used the recognised method in performing the operation. A verdict of death by misadventure was recorded.[1]

Diary of the Week

APRIL 3 TO 9

Tuesday, 5th

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2

5 P.M. Mr. V. E. Negus: Comparative Anatomy and Physiology of the Respiratory Tracts in relation to Clinical Problems. (Lister oration.)

Wednesday, 6th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1

5.15 P.M. *History of Medicine.* Prof. G. R. Cameron, F.R.S.: Von Kolliker. Dr. Brice Clarke: Katherine Mansfield's Illness.

MANCHESTER MEDICAL SOCIETY

4.30 P.M. (Medical School.) *Medicine.* Prof. Robert Platt: Life (biological not biographical).

Thursday, 7th

ALFRED ADLER MEDICAL SOCIETY

8 P.M. (11, Chandos Street, W.1.) Prof. Alexander Kennedy: Human Reactions to Danger.

Appointments

BOYD, T. A. S., M.B. Glasg., F.R.C.S., D.O.M.S.: part-time ophthalmic surgeon, Bangour Hospital, Broxburn, West Lothian.

CLARKE, D. M. P. R., M.B. N.U.I., D.M.R.D.: radiologist, Mayo county council.

DE WYTT, W. H. DE W., M.CH.ORTH. Lpool, F.R.C.S., F.R.C.S.I.: orthopædic surgeon, Meath county council.

FAIRLEY, H. BARRIE, M.B. Lond., F.F.A. R.C.S., D.A.: anæsthetist, Toronto General Hospital, and clinical assistant, University of Toronto.

HENRY, H. S. A., M.B. Belf., F.R.C.S., D.P.H., D.L.O.: part-time consultant E.N.T. surgeon, South Down and South Armagh group of hospitals.

O'SULLIVAN, R. F., M.B. N.U.I., D.P.H.: appointed factory doctor, Shelf, York.

Birmingham Regional Hospital Board:

ANTON-STEPHENS, DEREK, M.B. Dubl., D.P.M.: whole-time psychiatrist and deputy medical superintendent, Highcroft Hall Hospital.

HAWKINS, C. F., M.D. Lond., M.R.C.P.: part-time consultant physician, mid-Worcestershire group.

STROUD, M. H., M.B. Birm., F.R.C.S.: part-time consultant E.N.T. surgeon, Birmingham (Dudley Road and West Bromwich groups).

THOMSON, J. F., M.B. Edin., D.P.M.: whole-time consultant child psychiatrist, Shrewsbury and Wolverhampton groups.

TUDOR, R. W., M.B. Birm., F.R.C.S.: whole-time senior casualty officer, Birmingham (Selly Oak group).

WALSH, PETER, L.R.C.P.I.: part-time asst. ophthalmologist, Wolverhampton group.

Manchester Regional Hospital Board:

CHADWICK, D. A., M.B. Manc., F.F.A. R.C.S.: consultant group anæsthetist, north and mid Cheshire hospital centre.

CHANDRA, PRAKASH, M.B. Lucknow, M.CH.ORTH. Lpool, F.R.C.S.: senior casualty officer, Burnley and district hospitals.

CHATTERJEE, S. S., M.B. Patna, M.R.C.P.: whole-time asst. chest physician, Baguley Hospital, Manchester.

JEWSBURY, PERCY, M.B. Manc., F.R.C.S.: consultant thoracic surgeon, Blackpool and Fylde Hospital Centre, and the northern part of the region.

SMITH, A. E., M.B. Edin., F.F.A. R.C.S.: consultant anæsthetist, Bolton and district group of hospitals.

TUTTON, G. K., CH.M. Manc., F.R.C.S.: consultant neurosurgeon, Preston and Chorley Hospital Centre, and northern part of the region.

1. *Liverpool Daily Post*, March 23, 1955.

Notes and News

MENTAL-HEALTH RESEARCH

THE first research fellow to be appointed by the Mental Health Research Fund, Dr. J. D. Montagu, was presented to those who had gathered at the Mansion House on March 23 to hear more about the fund's future plans. Sir SEYMOUR HOWARD, the Lord Mayor, spoke of the advances in treatment and prevention of mental ill health which the work of the fund may reasonably hope to forward. Dr. W. S. MACLAY, introducing the speakers, mentioned three main lines by which research in this field is at present advancing: by sociological studies of the incidence of mental illness and the like, by studies of the individual by psycho-analysis and allied methods, and by studies of an organic nature into the physiology, biochemistry, and electrophysiology of the brain. For the present, he said, the fund is confining its scope to the third of these. Dr. DENIS HILL spoke of the light electro-encephalography has already thrown on epilepsy, and of its value in locating cerebral tumours. He described cases of epilepsy originating in the temporal lobe which have been treated successfully by removal of the brain area in which the epileptic discharge takes place. In the last four years, he said, 50 patients have been treated in this way, and results have so far been encouraging: over half have been freed from fits and 85% have been greatly helped.

Dr. ELIOT SLATER, speaking of the genetic aspects of mental disorder, recalled that one of the first diseases in which an inherited factor was recognised was a mental disease—Huntington's chorea. Other mental disorders do not give such clear evidence as this, but studies of siblings, and especially of uniovular twins, have already shown that genetic factors operate in mental illness. This, he said, does not mean we need despair about mental disorders: the inherited factors are of a biochemical nature, and presumably will in time be as open to treatment as other disorders of body chemistry. Moreover, the mental health of the person depends not only on his heredity but also on his environment and the stresses to which life exposes him. He cited a pair of uniovular twins, one of whom became a criminal, while the other led an equally exciting and dangerous life without finding it necessary to turn to crime. Prof. J. ELKES spoke of the use of drugs in research and treatment, and the information being gained from studies of hallucinogenic drugs, and also from the effects of 'Sodium amytal' in rousing schizophrenics temporarily from stupor. Through such studies as these, he said, we may come in time to detect early mental illness by chemical means, and perhaps to suggest antidotes.

In concluding the meeting, Sir GEOFFREY VICKERS said that some might ask what need there was for this fund when the Medical Research Council and the Clinical Research Board already administer funds for research. He thought it wrong, he said, that research in any field should rely for support on a single public source, however well administered. In a voluntary enterprise, such as this fund, interest could be canalised and specific.

THE INDUSTRIAL HEALTH AND SAFETY CENTRE

THIS centre, at 97, Horseferry Road, London, S.W.1, was opened on March 22 by Sir Walter Monckton, Minister of Labour and National Service. Formerly known as the Safety, Health, and Welfare Museum, it has lately been thoroughly reorganised, and the exhibits now illustrate the most up-to-date arrangements for protecting the life and limbs of the industrial worker. Pointing out that the planners have recognised that not all factories are equally modern in design or equipment, the Minister said that the centre should prove specially valuable in showing how old-fashioned machinery can be made effectively safe; and he hoped that full advantage would be taken by visitors—whether they came as individuals or as delegates from a factory—of these latest ideas and practices.

On the ground floor are demonstrated various types of safety device for use on drills, presses, lathes, and other pieces of moving machinery. One section deals with dust diseases, and includes examples of the masks and clothing devised for workers exposed to this hazard. Another is devoted to the needs of disabled workers, and indicates some of the ways by which these people may, after suitable training, resume profitable employment. Here too are described pictorially the factors that should be considered in assessing the particular aptitude of the young worker; and mention is

made of the commonly encountered problem of the employee who believes, against medical evidence, that his work is undermining his health.

The floor above deals with some of the commoner industrial and occupational hazards. Posters and drawings bring home the need for simple common-sense precautions—e.g., the importance of wearing protective goggles in any process involving a risk to the eyes, and the wisdom of making sure that electrical fittings are soundly constructed and regularly inspected. Finally, there are some interesting exhibits relating to the factory canteen: these demonstrate the folly of guarding the worker against trauma while leaving him exposed, during his lunch-hour break, to the more subtle menace of *Salmonella typhimurium*.

THE OTHER SIDE OF THE TABLE

APPLICANTS for posts in medicine, as in other professions, are expected to pass an examination for which their training has not specifically prepared them. Some bring a native shrewdness to the task, and do well; others, equally well fitted for the post, are defeated by native shyness. Not a few, perhaps, could learn something to their advantage from *The Intelligent Teacher's Guide to Preferment*,[1] in which a director of education offers advice from the selection committee's side of the table. Having dealt with such important details as the candidate's application form and covering letter and his choice of referees, the author reminds candidates that though they may be ill at ease at the interview, so also may be the interviewing committee. "The wise candidate makes a swift assessment of the situation and does his best to put the committee at their ease, however many butterflies may be fluttering in his own stomach."

Royal College of Obstetricians and Gynæcologists

Mr. Vincent Massey, Governor-General of Canada, and Dr. George W. Corner, of Baltimore, will be admitted to the honorary fellowship of the college on July 22.

Prof. B. P. Watson, of Columbia University, New York, has been elected William Meredith Fletcher Shaw lecturer for 1955.

South West Metropolitan Region

Chest Diseases Group (Eastern Area).—The inaugural meeting of this group will be held at St. James' Hospital, Balham, at 2.30 P.M. on Saturday, April 23, when Sir Clement Price Thomas will speak on Carcinoma of the Lung.

U.S. Surgeon-General

Major-General Silas B. Hays, Army Medical Corps, has been appointed surgeon-general of the United States Army, in succession to Major-General George E. Armstrong, who is retiring.

Faculty of Anæsthetists

The seventh anniversary dinner of the faculty was held in the Royal College of Surgeons on March 23. Proposing the toast of The Faculty, Sir Charles Dodds said that the last twenty years had witnessed a revolution in the practice of anæsthesia. No longer had patients to undergo the rigours of rag-and-bottle induction, or endure the gastro-intestinal qualms that followed return to consciousness. Thanks to basal anæsthetics, these were things of the past; it was unfortunate, he reflected, that some equally effective technique was not available to after-dinner speakers to facilitate the descent of their audiences into welcome unconsciousness. In reply, Dr. Bernard Johnson, the dean, spoke of the faculty's responsibilities in the fields of teaching, clinical practice, and research. The new anæsthetic research department to be established within the college had been most generously supported by pharmaceutical firms. As a result, the faculty would continue to lead the world in the advance of anæsthesia. Dr. R. F. Woolmer, vice-dean, welcomed the guests in rhyming iambic pentameters—an orthometrical tour-de-force that provoked enthusiastic applause. Replying, Sir Russell Brain disclaimed poetic skill, but went on to leave no doubt as to his mastery of prose. He noted that anæsthesia, having been the companion of surgery for a century, was now being wooed by medicine. Already it had established a place for itself in psychotherapy, and there was growing evidence of its value in the treatment of tetanus and bulbar poliomyelitis—facts which proved once again that the more specialised specialties become, the more dependent they are on each other.

1. By MARIUS ROSE. London: Chatto & Windus. 1954. Pp. 96. 6s.

Queen's Institute of District Nursing

Dr. G. O. Barber is to speak at the conference which this institute is holding at Church House, Westminster, S.W.1, on Thursday, May 12, at 2.30 P.M., on the Link between Hospital, General Practitioner, and the District Nursing Service.

Harveian Society of London

Buckston Browne Prize.—The subject chosen for the essays for this prize (£100) for 1956 is Hypertension. Entry is open to any doctor, registered in the British Isles or Dominions, who is under 45 years of age. Essays must be sent by Aug. 31, 1956, to the hon. secretaries of the society, 11, Chandos Street, W.1.

Association of Sea and Air Port Health Authorities of the British Isles

The annual general meeting of this association is to take place in London from June 8 to 10. Dr. R. H. Barrett will give a general review of the state of port health administration at the present time, and Dr. W. D. L. Smith will speak on Malaria and the Thames.

Basingstoke Plastic Centre Medical Society

On Thursday, April 14, at 7.30 P.M., at Rooksdown House (Park Prewett Hospital), Basingstoke, Hants, this society will hold a meeting on burns with special reference to the effects of atomic explosions. The speakers will include Prof. R. H. S. Thompson, Dr. W. J. Butterfield, Dr. P. Gorer, Mr. Douglas Jackson, and Dr. J. P. Bull.

European Rheumatology Congress

This congress is to be held at The Hague from June 13 to 17. The programme is divided into sections on rheumatic fever, connective tissue, osteo-arthritis of the spine and disc degeneration, and rheumatism and social medicine. Speakers from this country will include Dr. E. G. L. Bywaters, Dr. L. E. Glynn, Dr. R. Consden, and Dr. E. J. Holborow. Further particulars may be had from the secretary, Dr. H. van Swaay, Burg. De Monchyplein 9, The Hague, Holland.

Welsh National School of Medicine

Dr. A. Trevor Jones, senior administrative medical officer of the Welsh Regional Hospital Board, is to succeed Prof. R. M. F. Picken as provost of the school. Professor Picken retires on Sept. 30.

Dr. Jones was educated at the Lewis School, Pengam, and he began his medical studies at the University College of South Wales and Monmouthshire, in Cardiff, before going to University College Hospital, London, where he qualified in 1924. After spending some years in hospitals in London, he returned to Wales in 1929, taking hospital appointments in Swansea and Carmarthen, where he also worked in general practice and became the medical officer of health. He was appointed a medical officer on the staff of the Welsh Board of Health in 1935, and during the late war he was the hospital officer for Wales under the Emergency Medical Service. Since the start of the National Health Service he has been the senior administrative medical officer to the Welsh Regional Hospital Board. He was elected F.R.C.P. in 1953. His publications include the report of the survey of the hospital service in South Wales which he carried out in association with Professor Picken and the late Professor Nixon, of Bristol, in 1945.

British Society for Research on Ageing

The following honorary officers and members of the executive committee have been elected:

Chairman, Sir Charles Dodds, F.R.S.; vice-chairman, Sir Francis Fraser; secretary, Mr. G. H. Bourne, D.SC. (London Hospital Medical College, London, E.1); treasurer, Prof. P. L. Krohn; members of committee, Prof. J. F. Danielli, D.SC., Miss E. B. Fell, F.R.S., Prof. K. J. Franklin, F.R.S., Prof. P. B. Medawar, F.R.S., Prof. R. E. Tunbridge.

Current Conceptions of Allergy

The Society for Visiting Scientists is to hold a meeting on this subject at 5, Old Burlington Street, London, W.1, on Wednesday, April 6, at 7.30 P.M. Sir Henry Dale, O.M., F.R.S., will be in the chair and the speakers will be Dr. Bernard Halpern, director of research at the Centre National de la Recherche Scientifique, Paris, Prof. J. R. Marrack, and Dr. J. Pepys.

Second International Congress of Neuropathology

This congress will be held in London from Sept. 12 to 17. The programme includes discussions on the Pathological Basis of Involuntary Movements, the Neurone, the Blood-brain Barrier, Malignancy and Classification of Gliomas, and (with the Symposium Neuroradiologicum) Tentorial Herniation of the Uncus. Further information may be had from Dr. W. H. McMenemey, Maida Vale Hospital for Nervous Diseases, W.9.

The Queen has consented to the title "Royal" being given to the Australian Flying Doctor Service.

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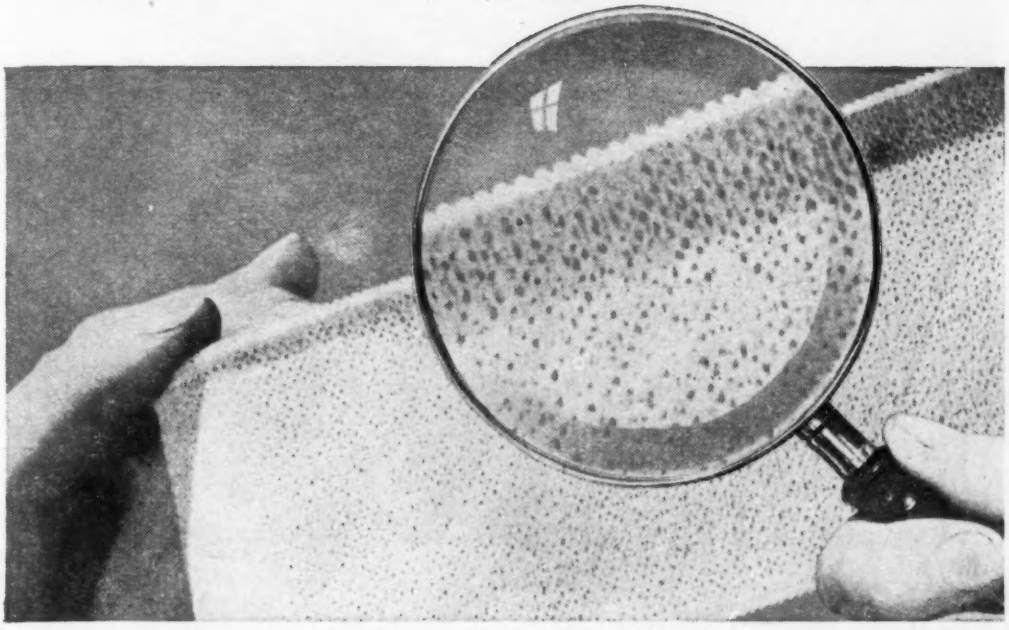

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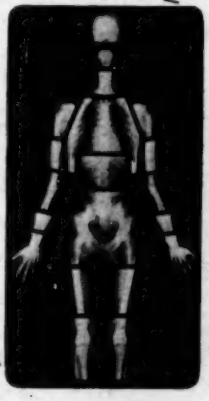

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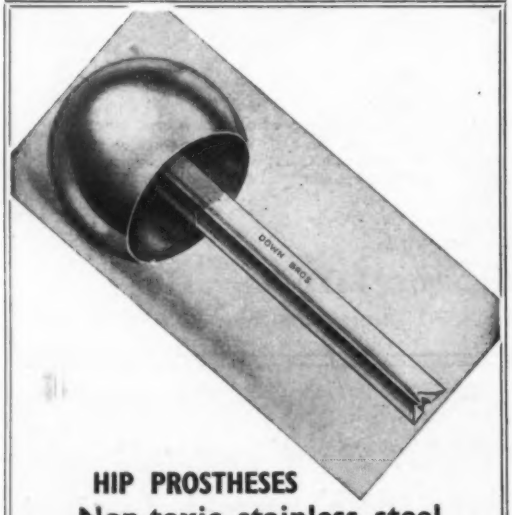

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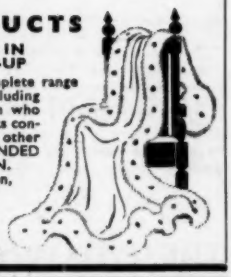

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The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

ROYAL COLLEGE OF SURGEONS OF ENGLAND

ELECTION OF PROFESSORS AND LECTURERS

The Council invites applications for election to the office of Hunterian Professor, Arris and Gale Lecturer, Arnott Demonstrator and Erasmus Wilson Demonstrator for the ensuing year.

The 12 Hunterian Lectures, illustrated by Hunterian specimens, are delivered by Fellows or Members of the College. The 3 Arris and Gale Lectures are on subjects relating to Human Anatomy and Physiology, the 6 Arnott Demonstrations on the contents of the Museum, and the 6 Erasmus Wilson Demonstrations on the Pathological contents of the Museum.

Applications in writing must be made to the Secretary on or before Saturday, 23rd April. Candidates for the Hunterian Professorships, Arris and Gale Lectureships are requested to submit with their applications 25 copies of a synopsis of approximately 500 words describing the subject matter of their proposed lecture.

In the case of Hunterian Lectures the Council is prepared to consider applications for either a series of lectures or a single lecture.

KENNEDY CASSELS, Secretary.

Lincoln's Inn-fields, London, W.C.2, 2nd April, 1955.

UNIVERSITY OF LONDON INSTITUTE OF EDUCATION

DIPLOMA IN THE CONTENT AND METHODS OF HEALTH EDUCATION

An advanced course for full-time students occupying 1 university year is open to qualified teachers, training college lecturers, medical practitioners, qualified nurses and others who are interested in the field of Health Education.

Candidates should have had experience in their own field and possess sufficient scientific background to satisfy the Institute that they can profit from the course.

The course is organised by the Institute of Education with the coöperation of the London School of Hygiene and Tropical Medicine and of the Central Council for Health Education.

Further particulars may be obtained from Miss W. M. WARDEN, Institute of Education, Malet-street, W.C.1.

THE UNIVERSITY OF LEEDS

PART-TIME COURSE FOR THE DIPLOMA IN PUBLIC HEALTH

A Course for the Diploma in Public Health will commence in OCTOBER, 1955, if sufficient entries are received. Instruction will be part-time and will occupy 5 academic terms. Students will require to spend 2½ days a week in each term in whole-time study, leaving the remainder of the time free for approved gainful employment. Candidates holding part-time Public Health appointments or with previous whole-time Public Health service may be granted exemption from some of the practical Public Health work, so reducing the whole-time study to approximately 2 days a week.

Candidates are asked to apply as soon as possible to the Sub-Dean, School of Medicine, Thoresby-place, Leeds, 2.

THE UNIVERSITY OF LIVERPOOL

FACULTY OF MEDICINE

DEPARTMENT OF ANÆSTHESIA

A COURSE OF POSTGRADUATE INSTRUCTION IN ANÆSTHESIA, limited to 10 students, will be conducted at the University of Liverpool lasting for 1 academic year and commencing 1ST OCTOBER, 1955. This course gives theoretical and practical instruction to students intending to sit for the Diploma or the Fellowship of the Faculty of Anæsthetists. For the purpose of gaining practical experience, the students will be found suitable appointments in recognised General Hospitals within the Liverpool area.

The fee for the course is £60.

Application forms may be obtained from the Reader in Anæsthesia, The University, Liverpool, 3, and should be returned not later than 30th April, 1955.

UNIVERSITY OF SHEFFIELD

COURSES OF INSTRUCTION for the DIPLOMAS IN MEDICAL DIAGNOSTIC RADIOLOGY (D.M.R.D.) and THERAPEUTIC RADIOLOGY (D.M.R.T.) will commence in OCTOBER, 1955.

The Courses will cover a period of 2 years of whole-time study, and the fee for each course is 50 guineas.

Applications to attend should be sent to the Dean of the Faculty of Medicine, The University, Sheffield, 10.

THE ROYAL LONDON HOMŒOPATHIC HOSPITAL

Great Ormond-street and Queen-square, London, W.C.1

COURSES OF INSTRUCTION IN THE PRINCIPLES AND PRACTICE OF HOMŒOPATHY for Medical Practitioners and Senior Students of Medicine.

SUMMER COURSE 1955

TUESDAYS, commencing 26TH APRIL, 1955 :

2 P.M., Repertorial Analysis.
3 P.M., Materia Medica of The Polycrests.
4 P.M., Illustrative Case Records.

FRIDAYS, commencing 29TH APRIL, 1955 :

3 P.M., Materia Medica.
4 P.M., Illustrative Case Records.

During the week commencing 2ND MAY, 1955, LECTURES will be given on bowel nosodes and the emanometer grouping of drugs.

Fee for registered medical practitioners, £10 10s. Medical students admitted without charge.

A limited number of Scholarships intended to meet the cost of travelling expenses are offered by The Homœopathic Research and Educational Trust to doctors to enable them to attend this Course.

Further particulars can be obtained on application to the Dean of the Education Course at the Hospital.

UNIVERSITY OF GLASGOW

MACEWEN MEMORIAL LECTURE

The Macewen Memorial Lecture will be delivered by Sir JAMES R. LEARMONTH, K.C.V.O., C.B.E., LL.D., CH.M. (Regius Professor of Clinical Surgery and Professor of Surgery, University of Edinburgh), in the Lecture Theatre, Chemistry Building, on FRIDAY, 15TH APRIL, 1955, at 3.30 P.M.

Subject : "A Search for Similarities."

Admission to the Lecture will be free, but by ticket only.

Application should be made to the Registrar, The University, Glasgow, W.2. A stamped addressed envelope should be sent.

UNIVERSITY OF GLASGOW

POSTGRADUATE MEDICAL EDUCATION COMMITTEE

REFRESHER COURSE FOR GENERAL PRACTITIONERS

A Refresher Course of 1 fortnight's duration designed for General Practitioners will be held from 16TH MAY to 28TH MAY, 1955. The greater part of the Course will comprise clinical demonstrations, ward visits, and lectures in general medicine, general surgery, and obstetrics, but sessions on infectious diseases, child health, ophthalmology, dermatology, and rehabilitation of the aged will also be included.

The fee for practitioners not claiming expenses from Government sources is 10 guineas.

Since the number admitted to the Course is limited, early application should be made to the Director of Postgraduate Medical Education, The University, Glasgow, W.2, from whom the syllabus and further information may be obtained.

MARLBOROUGH DAY HOSPITAL

38, Marlborough-place, N.W.8

General Practitioners and professional people working in the mental health field are invited to LECTURES held at the above on the first MONDAY in every MONTH at 8.15 P.M.

On MONDAY, 4TH APRIL, Dr. MICHAEL FORDHAM will speak on : "Jung's Contribution to Social Psychiatry."

UNIVERSITY OF EDINBURGH. Department of Child LIFE AND HEALTH. Applications are invited from medical graduates holding a higher medical qualification, for the post of Full-time LECTURER in the Department of Child Life and Health. The duties will be those of teaching, care of patients and prosecution of research under the Professor of Child Life and Health. The appointment will carry the clinical status of Assistant Senior Registrar. Salary (presently subject to review) will be in the range £1100–£1500 p.a., with placement according to experience and qualifications and with superannuation benefit and family allowance where applicable.

Further particulars may be obtained from the undersigned with whom applications, giving the names of 2 referees, should be lodged not later than 9th April, 1955.

CHARLES H. STEWART, Secretary to the University.

UNIVERSITY COLLEGE OF SOUTH WALES AND MONMOUTHSHIRE. Required, DEMONSTRATOR (Woman) for part-time teaching duties in the Department of Anatomy, University College, Newport-road, Cardiff. The appointment involves attendance on 4 afternoons per week during the College term and carries an honorarium of £300 per session. Duties to commence 1st October, 1955.

Further particulars from the Registrar, University College, Cathays Park, Cardiff, to whom applications should be sent by 29th April, 1955.

UNIVERSITY COLLEGE OF SOUTH WALES AND MONMOUTHSHIRE. Applications are invited from registered medical practitioners for 2 posts of ASSISTANT LECTURER IN ANATOMY. 1 appointment will commence on 1st August, 1955, the other on 1st October, 1955. Salaries will be in the scale £750–£100–£1050 with family allowance and superannuation benefits. Facilities will be provided for research.

Applications (8 copies), together with the names of 3 referees, should be sent to the undersigned, from whom further particulars may be obtained, not later than 29th April, 1955.

E. R. EVANS, Registrar.

UNIVERSITY OF ALEXANDRIA. Faculty of Medicine. SCHOOL OF DENTAL SURGERY, ALEXANDRIA (EGYPT). Applications are invited for the following whole-time post :—

CHAIR OF DENTAL PROSTHESIS.

Applicant must be a registered dental practitioner of long standing in the profession, must have been qualified for at least 18 years, and must have teaching experience in a University or a recognised Institute for not less than 8 years. The appointee is expected to lecture on dental prosthesis and to help in the development of this subject as well as in any other subject related to it that he may be charged with.

(i) The period of the first contract is for 2 years and can be renewable for further periods of 5 years.

(ii) Medium of lecturing is the English language.

(iii) Salary £E900–£E1500, according to scientific status, exclusive of expatriation and high cost-of-living allowance, and income-tax deduction of approximately 9%.

(iv) The University will pay travelling expenses to both Professor and his family to Egypt on presentation of official receipt as well as expenses of homeward journey at the termination of the contract period whatever it may be. A vacation of 2 months in the summer is allowed yearly.

(v) If the contract is for more than 3 years, the University will pay the Professor and his family the travelling expenses for home leave during the summer once every 3 years.

(vi) After the termination of the contract, the University will undertake to pay the Professor 1 months salary for every year of his service at the University, provided that his service is not less than 5 years.

Applications should be addressed to the Dean, Faculty of Medicine, Alexandria University, Egypt, and should include particulars as to the academic qualifications, experience, and publications, together with the names of 3 referees, and should be received not later than 31st May, 1955.

UNIVERSITY OF ALEXANDRIA. Faculty of Medicine. Applications are invited for the following posts :—

(1) Whole-time PROFESSOR IN CLINICAL SURGERY.

Applicant must be duly qualified in surgery and must possess adequate practical and teaching experience in a recognised University or Institute of not less than 8 years duration, and must have published several original researches.

(2) Whole-time PROFESSOR IN NEUROLOGY.

Applicant must be duly qualified in both general medicine and neurology, and must possess adequate clinical and teaching experience in a recognised University or Institute of not less than 8 years duration. Original research in the field of Neurology is essential.

(3) Whole-time PROFESSOR IN PHYSIOLOGY.

Applicant must be duly qualified in both general and human physiology, must possess adequate teaching experience of not less than 10 years in a recognised University.

Salary in each of the above 3 cases £E1500–£E2500 p.a., according to scientific status and experience. Private consultations may be considered after the first year of office in the case of the first 2 posts.

(4) ASSISTANT PROFESSOR IN ANATOMY.

Applicant must be a medical graduate with special training in Anatomy and Embryology. He must have had teaching experience in a recognised University or Institute for not less than 6 years and must have published original research. Salary £E1000–£E1500 p.a.

General terms concerning above-mentioned posts :—

(1) Medium of teaching in all cases is English.

(2) The appointment contract is made for 1 or 2 years at the start, after which, if both parties are desirous, the contract is renewable for a period of 5 years, and may be renewed further.

(3) Alexandria University will pay the travelling expenses of the appointed person and his family to Egypt.

(4) A foreign appointee with a long-term contract is entitled to a free return passage for himself and his family to their country during the summer vacation once every 3 years.

(5) At the termination of the contract the appointee will receive a bonus of 1 months pay for each year of service and will also receive his travelling expenses and that of his family for their journey home.

Applications should be addressed to the Dean, Faculty of Medicine, Alexandria University, Egypt, and must include particulars as to age, academic qualifications, experience, copies of original publications, and the names of 3 referees. Applications should reach Alexandria not later than 31st May, 1955.

THE INSTITUTE OF LARYNGOLOGY AND OTOLOGY (UNIVERSITY OF LONDON), 330/332, Gray's Inn-road, W.C.1. FIRST ASSISTANT to the Professorial Unit. Applications are invited for this post with effect from 1st June, 1955. A higher qualification in surgery is required and candidates must have held an Oto-laryngological Registrarship in a teaching hospital. The post is a full-time one tenable for an initial period of 1 year, subject to annual re-election thereafter, and the successful applicant will be given honorary rank as a Senior Registrar at the associated Royal National Throat, Nose and Ear Hospital. Salary within the range £1200–£1500 with superannuation benefits, the commencing salary being determined according to experience and particularly any previous service in the Senior Registrar grade. Family allowances on the University scale are payable.

Applications in triplicate, giving full particulars of age, qualifications and experience and accompanied by the names of 2 referees, should be sent to the Secretary not later than 30th April.

Hospital Services : Senior Appointments

ELIZABETH GARRETT ANDERSON HOSPITAL, N.W.1. ROYAL FREE HOSPITAL GROUP. Consultant in Psychological Medicine. Applications are invited from Women medical practitioners for the post of Part-time PHYSICIAN in Psychological Medicine. Duties to commence 1st October, 1955. Experience with children as well as adult patients would be an advantage.

Applications, stating details of qualifications and experience, and giving the names of 3 referees, should be forwarded to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, London, W.C.1, not later than 2nd May, 1955.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) Part-time CONSULTANT ORTHOPÆDIC SURGEON (2 sessions a week). Mildmay Mission Hospital, Austin-street, E.2. Candidates should be in sympathy with the evangelical aims of the Hospital.

(2) Part-time ASSISTANT OPHTHALMOLOGIST (Senior Hospital Medical Officer grade) at Essex County Health Services Clinics as follows :—

Glasson House, Grays—2 sessions a week.
Annalee-road, Aveley—1 session a week.
Craylands, Vange—1 session a month.
Wickford—1 session a month.
Pitsea—1 session a month.
Westland-avenue, Hornchurch—1 session a month.

(3) Part-time ASSISTANT OPHTHALMOLOGIST (Senior Hospital Medical Officer grade) at Essex County Health Services Clinic, Coval-lane, Chelmsford, for 2 sessions a week.

Separate applications (6 copies), stating post concerned and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 16th April, 1955.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the post of Part-time CONSULTANT ANÆSTHETIST. Duties to commence 1st October, 1955.

Applications, giving the names of 3 referees, should be forwarded to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, London, W.C.1, not later than 2nd May, 1955.

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified practitioners for the post of CLINICAL ASSISTANT in the Allergy Clinics (Wright-Fleming Institute of Microbiology) for 2 notional half-days per week ; graded Senior Hospital Medical Officer. The appointment will be as from a date to be arranged.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, by 20th April, 1955.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time appointment of ASSISTANT ORTHOPÆDIC SURGEON (Senior Hospital Medical Officer scale) for duties at hospitals in the Pontefract and Castleford Group. The person appointed to reside in or near Pontefract.

Applications (12 copies), stating age, qualifications and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 23rd April, 1955.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. Applications are invited for the appointment of a CONSULTANT ASSISTANT DENTAL SURGEON with special experience in prosthetic dentistry. The contract would be for 1, 2 or 3 nominal sessions per week, and in accordance with the terms and conditions of service of hospital dental staff.

Full details of experience (with relative dates) should accompany applications, stating age, and giving 3 names for reference, and should be forwarded to the Secretary to the Board, The General Infirmary at Leeds, Leeds, 1, by not later than 16th April, 1955.

LIVERPOOL REGIONAL HOSPITAL BOARD. The UNITED LIVERPOOL HOSPITALS. Applications are invited for the post of Whole-time ASSISTANT PLASTIC SURGEON (Consultant). Duties will be to assist the existing Senior Plastic Surgeon and will be mainly at Whiston Hospital, Alder Hey Children's Hospital and with 1 session at the Royal Southern Hospital. In addition to the above duties the person appointed will be required to attend at other hospitals in the Region and to conduct outpatient clinics at peripheral hospitals. Applicants must possess a Fellowship of the Royal College of Surgeons of England, Edinburgh or Ireland, and have had considerable experience of plastic surgery. After 3 years service the Boards will be prepared to consider an application to amend this appointment to maximum part-time sessions.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 23rd April, 1955.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Part-time (8 half-days) post of CONSULTANT CHEST PHYSICIAN to the Burnley and District Hospital Centre. Successful applicant will be in charge of the Chest (including pulmonary tuberculosis) Diseases Service in the area, chest clinics in Burnley and neighbouring hospitals and pulmonary tuberculosis beds at Marsden Hospital and will have beds in the general medical wards at Burnley General Hospital. Good training and experience in general medicine, special experience in chest diseases and Membership of a Royal College of Physicians essential. 18th April, 1955.

(*b*) Whole-time or maximum part-time post of CONSULTANT ANÆSTHETIST to the Wigan and Leigh Hospital Centre (Royal Albert Edward Infirmary, Wigan, Leigh Infirmary, &c.) and at Wrightington Hospital (thoracic and orthopædic surgery). Wide experience and higher qualification in anæsthetics essential. Appointee to live in area. 11th April, 1955.

(*c*) Whole-time or maximum part-time (9 half-days) resident post of CONSULTANT PSYCHIATRIST AND MEDICAL SUPERINTENDENT to Whittingham Hospital, near Preston (about 3000 Beds) AND CONSULTANT PSYCHIATRIST to Blackpool and Fylde Hospital Management Committee, with clinics at Victoria Hospital, Blackpool. Building has commenced on a modern house in the grounds. Applicants must be of high professional standing with wide experience and possess higher qualifications. 14th April, 1955.

Application forms from the Senior Administrative Medical Officer to the Board at Cheetwood-road, Manchester, 8, to be returned by dates stated.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of Full-time SENIOR HOSPITAL MEDICAL OFFICER (non-resident). Previous experience in ophthalmology essential. The terms and conditions of service for hospital medical and dental staffs will apply.

Applications, giving details of past experience and qualifications, together with the names of 3 referees, to be addressed to the undersigned as early as possible. (Special application forms can be obtained on request.)

F. J. CABLE, Secretary, United Manchester Hospitals.

OXFORD REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the whole-time post of ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) to the Fair Mile Hospital, near Wallingford, Berks, and its associated clinics, as a member of the area team. Single accommodation is available. Candidates should hold the D.P.M. or its equivalent and must have had considerable experience of psychiatry. Applicants are invited to visit the hospitals by arrangement with the Physician-Superintendent.

Applications (10 copies), stating age, qualifications, and experience, with the names and addresses of 3 referees, should reach the Secretary, Oxford Regional Hospital Board, 43, Banbury-road, Oxford, by 29th April, from whom further particulars are available.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the part-time appointment of a PHYSICIAN (Consultant status) on 5 sessions to undertake duties in connection with the care and assessment of the aged and chronic sick in the Edinburgh area. The person appointed will have clinical charge of an assessment Unit at the Longmore Hospital and will act as Consultant to other chronic sick hospitals in the area. The appointment is subject to the provisions of the terms and conditions of service of hospital medical and dental staffs (Scotland).

Applications, giving particulars of age, qualifications, and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, by 30th April, 1955.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for a whole-time appointment of ANÆSTHETIST (Senior Hospital Medical Officer grade) for duty in the hospitals in the eastern half of the County of Fife, based on Kirkcaldy General Hospital. The appointment is subject to the terms and conditions of the National Health Service.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, 11, Drumsheugh-gardens, Edinburgh, 3, by 23rd April, 1955.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time ASSISTANT PSYCHIATRIST, at the Royal Scottish National Institution, Larbert. Salary (at age 32 and over) on the scale £1500–£50–£1950. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments :—

CONSULTANT THORACIC SURGEON based at Hairmyres Hospital, East Kilbride. The appointment will be whole-time or on the maximum part-time basis of 9 notional half-days per week.

CONSULTANT RADIOTHERAPIST based at the Western Infirmary, Glasgow, for duties in the Regional Radiotherapy Service. The appointment will be whole-time or on the maximum part-time basis of 9 notional half-days per week.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required for the Coppice Hospital, Mapperley, Nottingham. A newly built house on the Hospital estate is available. Salary scale £1500–£50–£1950.

Application forms and further details obtainable from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 22nd April, 1955.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST for the Pastures Hospital, Mickleover, near Derby. Salary scale £1500–£50–£1950.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Form to be returned by 30th April, 1955.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT RADIOTHERAPIST for the Sheffield National Centre for Radiotherapy. Candidates should be in possession of the D.M.R.(T). The successful applicant will work under the direction of the Medical Director. Salary scale £1500–£50–£1950.

Application forms and further details from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 30th April, 1955.

NEW ZEALAND. NORTH CANTERBURY HOSPITAL BOARD, CHRISTCHURCH, NEW ZEALAND. Part-time Medical staff required. Due to impending retirements, vacancies will arise on the Board's Part-time Visiting Medical staff as from 31st May, 1955, for :—

1 SENIOR ORTHOPÆDIC SURGEON.
1 SENIOR SURGEON (general).

These positions each involve an average of 14 hours duty per week, beyond which appointees may engage in private practice in the city. Initial appointment will be for a period of 3 years as from 1st June, 1955, at the expiry of which reapplication will be necessary. Applicants should have been qualified for not less than 10 years, should possess higher qualifications appropriate to their specialties and have had at least 5 years experience in those specialties. With such qualifications the annual remuneration on existing rates will be approximately £800 NZ for each appointment.

Applications close with the undersigned at 9 A.M. on Monday, 9th May, 1955. Special forms of application and any further information required may be obtained on request. It is expected that applications will be received from present members of the Board's part-time staff. ALEX. PRENTICE, Secretary.

NEW ZEALAND. THAMES HOSPITAL BOARD. Applications are invited from registered medical practitioners for the full-time appointment of ASSISTANT MEDICAL SUPERINTENDENT, Thames Hospital. It is desirable that main interests of the appointee should lie in medicine and anæsthetics. Salary in accordance with Hospital Employment Regulations as either Senior Registrar £NZ887 12s.–£NZ1002 12s., plus board and lodging if single and furnished residence if married ; or Junior Specialist £NZ1371 7s.–£NZ1671 7s., with residence available and heat and light and furniture at a deduction of £178 10s. Duties to commence 1st July, 1955. Conditions of appointment and form of application may be obtained from the Office of the High Commissioner for New Zealand, 415, Strand, London, W.C.2, England, or the undersigned.

Applications addressed to the Secretary, P.O. Box 53, Thames, should be posted air-mail and close on Monday, 2nd May, 1955.

F. HOPKINSON, Secretary, Thames Hospital Board.
Thames, New Zealand.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for the whole-time post of SECOND CONSULTANT PSYCHIATRIST to the Special Care Service (under the Mental Health Act (Northern Ireland), 1948) for persons suffering from arrested or incomplete development of mind. The terms, conditions of service, and remuneration will be in accordance with the Authority's application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 18th April, 1955.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for the undernoted LOCUM TENENS posts in hospitals in Northern Ireland.

Obstetrics and Gynæcology (2 posts).
(i) 1st May–4th September, 1955.
(ii) 2nd July–31st August, 1955.

Anæsthetics (2 posts).
(i) 13th June–21st September, 1955.
(ii) 1st July–31st August, 1955.

Radiology (1 post).
1st June–30th September, 1955.

General Medicine (2 posts).
(i) 24th April–30th September, 1955.
(ii) 24th June–30th September, 1955.

Remuneration will be at the rate of 31½ guineas per week.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned as soon as possible.

PERSIAN GULF. DOHA HOSPITAL, Qatar State, PERSIAN GULF. Applications are invited for the post of ANÆSTHETIST to this 100-bed air-conditioned State Hospital. Qualifications D.A. or F.F.A.R.C.S. essential. Besides anæsthetics some medical work inside Hospital. Ability to speak Arabic or Persian an asset. Salary, Indian Rupees 2700 per month with annual increment of Rs.100 per month to Rs.3200 per month (approximately equivalent to £2412–£90 p.a.–£2865 p.a.). No income-tax, but high cost of living. Free fully furnished accommodation, fuel, light and water. Car allowance to cover purchase and running costs of car used on official duties. Agreement 5 years with annual leave 2 months. Free passages for doctor, wife and 3 children. Climate Qatar pleasant 7 months, hot and sticky 5 months, this disadvantage offset by air conditioning and annual leave.

Applications, giving details of training, qualifications, experience, age, nationality, marital status, 3 copies of testimonials and photograph, should be sent by air-mail to State Medical Officer, Doha, Qatar State, Persian Gulf.

Hospital Services : Junior Appointments

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. SENIOR HOUSE OFFICER (Anæsthetist). Whole-time, resident, for 6 months, renewable. Previous experience in anæsthesia essential. The Hospital is recognised for the D.A. and F.F.A.R.C.S.

Applications, with copies of 2 testimonials or names of 2 referees, to Medical Director by 9th April, 1955.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required in Obstetric and Gynæcological Department. Post approved for M.R.C.O.G. examination. Pre-registration appointment. Appointment for 6 months from 18th May.

Applications, with 1 copy of 2 testimonials, to Medical Director by 9th April, 1955.

BROMPTON HOSPITAL, S.W.3. Applications are invited for the post of ANÆSTHETIC REGISTRAR (full-time). The appointment is for 1 year with eligibility for re-appointment.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 14th April, to KENNETH A. F. MILES, House Governor.

BROMPTON HOSPITAL, S.W.3. Applications invited for the following posts :—

NON-RESIDENT HOUSE PHYSICIAN for which there are 3 vacancies, for 6 months from 1st June. Duties include work in Outpatient Department and wards. Salary £475 or £525 a year, according to experience.

RESIDENT SURGICAL OFFICER (post graded as Senior House Officer or Registrar, according to qualifications and experience), for which there are 3 vacancies, for 6 months from 1st May with eligibility for reappointment. Candidates must have held a resident hospital appointment.

Applications, stating age, qualifications with dates, nationality and appointments held, together with copies of testimonials, by 9th April to—

KENNETH A. F. MILES, House Governor.

BROMPTON HOSPITAL, S.W.3. Applications invited for post of SURGICAL REGISTRAR (whole-time). The appointment is for 1 year with eligibility for reappointment. Candidates must hold the Diploma of F.R.C.S.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 14th April, to KENNETH A. F. MILES, House Governor.

BATTERSEA GENERAL HOSPITAL, S.W.11. House PHYSICIAN (residence optional), vacant early May. Not pre-registration.

Apply Hospital Secretary, enclosing copies of 2 recent testimonials.

EAST END MATERNITY HOSPITAL, 384-398, Commercial-road, London, E.1. (60 Beds. Posts recognised for M.R.C.O.G.)

RESIDENT SENIOR OBSTETRICAL OFFICER (Senior House Officer) required for 1 year.

RESIDENT OBSTETRICAL OFFICER (House Officer third post) required for 6 months.

Posts vacant 1st May, 1955.

Applications, with copies of testimonials, to the Secretary, Stepney Group Hospital Management Committee, Raine-street, Wapping, E.1.

GUY'S HOSPITAL, S.E.1. Applications are invited for the appointment of REGISTRAR to the Radiotherapy Department (whole-time). D.M.R. preferred but not essential. Duties to commence as soon as possible.

Forms of application, obtainable from the Superintendent, Guy's Hospital, should be forwarded not later than 12th April, 1955.

HACKNEY HOSPITAL, London, E.9. (General—844 Beds.) Applications for the 6 months appointment of CASUALTY OFFICER AND E.N.T. HOUSE SURGEON (House Officer grade), now vacant, should reach the Group Secretary at above address, as soon as possible, quoting HH/CHO.

HOSPITAL FOR WOMEN, Soho-square, W.1. (Affiliated to the Middlesex Hospital.) Applications are invited for a full-time post of RESIDENT SENIOR GYNÆCOLOGICAL HOUSE OFFICER, vacant on 1st July, 1955. Appointment is for 6 months but the holder can apply for an extension of 6 months. Salary in accordance with the terms laid down for medical and dental staffs, less a deduction of £125 p.a for residential emoluments. The appointment is recognised for the M.R.C.O.G. examination.

Applications, stating age, nationality, qualifications and experience, supported by the names and addresses of 2 referees, must reach the undersigned not later than Wednesday, 13th April. D. C. EMERY, Secretary.

LAMBETH HOSPITAL, Brook-drive, S.E.11. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the post of SURGICAL REGISTRAR vacant in July. The appointment is normally for 2 years but is subject to review at the end of 1 year. Recognised for the F.R.C.S. Duties include general surgery with some orthopædic and E.N.T. work. The post is resident or non-resident, but if the latter, the person appointed will be required to sleep in on nights on duty. Canvassing will disqualify but candidates are not precluded from visiting the Hospital if they so desire.

Forms of application from The Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11 (enclosing stamped addressed envelope). Applications to be returned not later than 22nd April, 1955.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. 2 vacancies occur 1st June, 1955, for RESIDENT HOUSE PHYSICIAN. Appointments for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and posts are graded as House Officer. Duties include work in the Outpatient Department and Refill Clinic as well as in wards.

Applications, stating age, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 23rd April.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

MEDICAL REGISTRAR (resident), Rush Green Hospital, Romford. (May include some duties in the Poliomyelitis Unit.)

MEDICAL REGISTRAR (resident), St. Leonard's Hospital, N.1.

MEDICAL REGISTRAR (resident or non-resident—but sleeping in on duty nights), St. Andrew's Hospital, Bow, E.3.

REGISTRAR in Obstetrics and Gynæcology (resident), St. John's Hospital, Chelmsford. Recognised for D.Obst. R.C.O.G. and M.R.C.O.G. Preference given to candidates working for Membership.

REGISTRAR in Obstetrics and Gynæcology (resident), Bethnal Green Hospital, E.2.

CASUALTY REGISTRAR (resident), General Hospital, Southend-on-Sea, Essex. Recognised for F.R.C.S. Post offers opportunities for work in Fracture Clinic in association with work of Orthopædic Department.

SURGICAL REGISTRAR (resident or non-resident), Bethnal Green Hospital, E.2. Recognised for F.R.C.S.

SURGICAL REGISTRAR (resident), Poplar Hospital, E.14. Recognised for F.R.C.S.

SURGICAL REGISTRAR (resident or non-resident), Haymeads Hospital, Bishop's Stortford, Herts.

REGISTRAR in General and Orthopædic Surgery (resident), Tilbury and Riverside General Hospital, Tilbury, Essex. Recognised for F.R.C.S.

Appointments subject to review after 1 year.

Separate applications in duplicate, with 2 copies of 2 recent testimonials, to Secretary, 11A, Portland-place, W.1, by 16th April, 1955.

MIDDLESEX HOSPITAL, W.1. Applications invited for post of REGISTRAR in the Department of Radiotherapy.

Forms of application obtainable from the Deputy Superintendent, should be submitted, naming 2 referees, by 16th April.

MIDDLESEX HOSPITAL, W.1. Applications invited for the post of REGISTRAR in the Department of X-ray Diagnosis.

Rules and application forms obtainable from the Deputy Superintendent to whom applications, naming 2 referees, should be submitted by 16th April.

MILE END HOSPITAL, Bancroft-road, E.1. (475 Beds.) HOUSE PHYSICIAN (pre- or post-registration) required for duty on 3rd May, 1955.

Application forms, obtainable from the Physician-Superintendent, to be returned by 8th April, 1955, with copies of not more than 3 testimonials.

NATIONAL HEART HOSPITAL, Westmoreland-street, W.1 (with which is associated the Institute of Cardiology). The Board of Governors invites applications to fill 2 vacancies in the post of REGISTRAR as from 1st June, 1955. Applicants should have been fully trained in general medicine and should possess a higher medical qualification. Opportunities for research are available.

Applications, with copies of 3 recent testimonials, should be sent to me not later than Saturday, 16th April, 1955.

ROBERT G. E. WHITNEY, Secretary to the Board.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of ASSISTANT REGISTRAR (whole-time) to the Outpatients' Department at The National Hospital, Queen-square, W.C.1. This post carries the grade of Senior Registrar. The appointment will be for 1 year in the first instance.

Applications, giving the names of 3 referees, to be sent to the undersigned not later than 16th April, 1955.

H. EWART MITCHELL, Secretary to the Board of Governors.

The National Hospitals for Nervous Diseases, Queen-square, W.C 1.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON at The National Hospital, Queen-square, W.C.1. This post carries the grade of Registrar.

Applications, giving the names of 3 referees, to be sent to the undersigned not later than 23rd April, 1955.

H. EWART MITCHELL, Secretary to the Board of Governors.

The National Hospital, Queen-square, W.C.1.

NORTH MIDDLESEX HOSPITAL, N.18, and EDMONTON CHEST CLINIC. Locum SENIOR HOUSE OFFICER (tuberculosis), resident, required, from 16th April for indefinite period. Duties at above Hospital and Clinic, under the direction of Chest Physician and Thoracic Surgeon. Further details on request.

Applications, stating age, nationality, qualifications, experience, together with copies of recent testimonials and/or names of 2 referees, to Secretary of Hospital, immediately.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER RESIDENT SENIOR CASUALTY OFFICER, for a period of 6 months, vacant 4th June, 1955.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 23rd April, 1955.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER RESIDENT SENIOR HOUSE SURGEON, for a period of 6 months, vacant 14th May, 1955.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 23rd April, 1955.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT GYNÆCOLOGICAL HOUSE SURGEON (third post), for a period of 6 months, vacant 2nd June, 1955.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 23rd April, 1955.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) Applications are invited from qualified medical practitioners for appointment as RESIDENT JUNIOR HOUSE SURGEON for Casualty (pre-registration first or second post) for a period of 6 months, vacant from 7th May, 1955.

Application form from the Secretary, Tottenham Group Hospital Management Committee (Group 4), The Green, N.15, to be returned by 23rd April, 1955.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) Applications are invited from qualified medical practitioners for appointment as RESIDENT JUNIOR HOUSE PHYSICIAN (pre-registration, first or second post) for a period of 6 months, vacant 7th June, 1955.

Application form from the Secretary, Tottenham Group Hospital Management Committee (Group 4), The Green, N.15, to be returned by 23rd April, 1955.

PUTNEY HOSPITAL, Lower Common, S.W.15. Casualty OFFICER AND E.N.T. HOUSE SURGEON (non-resident, Senior House Officer grade) vacant 25th April. Recognised for F.R.C.S.

Applications, enclosing copies of 3 recent testimonials, to Hospital Secretary by 6th April.

PUTNEY HOSPITAL, Lower Common, S.W.15. Casualty OFFICER AND FRACTURE HOUSE SURGEON (non-resident, Senior House Officer grade), vacant 3rd May. Recognised for F.R.C.S.

Applications, enclosing copies of 3 recent testimonials, to Hospital Secretary by 6th April.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, London, E.15. HOUSE PHYSICIAN (Male or Female; third post), for 6 months commencing 6th May, 1955.

Applications, with copies of recent testimonials, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 16th April, 1955.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER (Male or Female) graded Senior House Officer, at Shadwell, E.1, to become vacant 1st June, 1955. Candidates must have had experience in the treatment of sick children. The appointment will be for 1 year.

Application forms may be obtained from the Secretary at Hackney-road, and should be returned, with copies of not more than 3 testimonials, not later than 7th April, 1955.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. HOUSE OFFICERS (2). Appointments will be made for 2 consecutive periods of 6 months commencing 1st June, 1955. First period as House Physician and second as House Surgeon and Casualty Officer.

Application forms may be obtained from the Secretary at Hackney-road and should be returned with copies of not more than 3 testimonials on or before 12th April, 1955.

ROYAL FREE HOSPITAL, London, W.C.1. Applications from registered medical practitioners (Men or Women) are invited for the post of Whole-time NON-RESIDENT SENIOR REGISTRAR in Clinical Pathology. Appointment for 1 year in the first instance, from 1st September, 1955. Experience in clinical pathology and in addition, special training in bacteriology is essential.

Applications should be sent to the Secretary to the Board of Governors at the above address, not later than Monday, 2nd May, 1955.

ROYAL FREE HOSPITAL, London, W.C.1. Applications are invited for the post of REGISTRAR to the Anæsthetic Department, vacant on 1st May. The post is resident and is for 1 year in the first instance. Salary in accordance with the scale laid down by the Ministry of Health for Registrars.

Application forms may be obtained from the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 12th April, 1955.

ROYAL FREE HOSPITAL, London, W.C.1. Applications from registered medical practitioners (Men or Women) are invited for the post of Whole-time NON-RESIDENT REGISTRAR in Clinical Pathology. Appointment for 1 year in the first instance, from 1st September, 1955. Some experience in clinical pathology is essential.

Applications should be sent to the Secretary to the Board of Governors at the above address, not later than Monday, 2nd May, 1955.

ROYAL MARSDEN HOSPITAL, Fulham-road, London, S.W.3. Applications are invited from registered medical practitioners for the 2 posts of HOUSE SURGEON (resident). Salary £525 p.a. The posts are tenable for 6 months from 18th May.

Forms of application are obtainable from the House Governor, to whom applications, together with copies of 3 recent testimonials, should be sent not later than Monday, 11th April.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, BROCKLEY HILL, STANMORE, MIDDLESEX. Applications are invited for the posts of RESIDENT SENIOR HOUSE OFFICERS (2 vacancies), for a period of 6 months. 1 to commence duties on 16th June and 1 on 9th July.

Applications to be received by 9th April. Forms of application can be obtained from the House Governor at 234, Great Portland-street, London, W.1.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER for a period of 6 months; duties to commence 9th June, 1955.

Applications to be received not later than 9th April, 1955. Forms of application can be obtained from the House Governor at 234, Great Portland-street, London, W.1.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1. Applications are invited for the appointment of CLINICAL ASSISTANT (whole-time). The post is graded as Senior House Officer status and will include assisting in outpatient and inpatient work. The work is that of a Junior Registrar and provides wide experience in orthopædics. The appointment to commence 1st July.

Applications to be received by 9th April. Forms of application can be obtained from the House Governor, 234, Great Portland-street, London, W.1.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics and gynæcology) vacant at end of April, 1955.

Applications to be sent to the Hospital Secretary by 13th April, 1955.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. Applications are invited for the post of HOUSE PHYSICIAN, vacant 4th May, 1955.

Applications, with copies of 2 testimonials, to be sent to the Hospital Secretary by 9th April, 1955.

ST. GEORGE-IN-THE-EAST HOSPITAL, Raine-street, Wapping, E.1. Applications are invited for the post of HOUSE PHYSICIAN (pre- or post-registration). Post vacant 8th April, 1955. Tenable for 6 months. Salary, &c., in accordance with national scale.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Superintendent.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Orthopædic Surgery to fill a vacancy in the approved trainee establishment at the Lewisham Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 16th April, 1955.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. Applications are invited for the post of SENIOR REGISTRAR in Children's Diseases, tenable at St. Bartholomew's Hospital for a period of 4 years, subject to annual re-election.

Applications, together with the names of 3 referees, should be submitted to the undersigned within 14 days of the appearance of this advertisement.

C. C. CARUS-WILSON, Clerk to the Governors.

St. Bartholomew's Hospital, London, E.C.1.

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited for the post of Part-time REGISTRAR to the Psychiatric Department (5 notional half-days). Previous experience in psychiatry is necessary; preference will be given to candidates holding the D.P.M. The appointment will be for a first period of 12 months, as from 1st June, 1955; remuneration at Registrar rates.

Applications, stating nationality, date of birth, permanent address, qualifications, dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 14th April, 1955.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of NON-RESIDENT CASUALTY SURGICAL OFFICER, graded Registrar; the F.R.C.S. qualification is desirable. The appointment is for a first period of 12 months, as from 1st June, 1955, the holder normally being eligible for re-election. The successful candidate will be required to work half-time in the Casualty Department and half-time on the Orthopædic Firm.

Applications, stating nationality, date of birth, permanent address, qualifications, with dates, details, and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 14th April, 1955.

ST. PETER'S AND ST. PAUL'S HOSPITALS. Vacancies exist for Honorary CLINICAL ASSISTANTS on Monday, Tuesday, Wednesday, and Thursday afternoon Outpatient Clinics.

Apply: House Governor, Henrietta-street, W.C.2.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There is a vacancy for a Whole-time ASSISTANT MEDICAL REGISTRAR (Registrar grade).

Further particulars and form of application, which must be returned not later than Monday, 11th April, 1955, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be vacancies for the following Senior House Officers on 15th July, 1955:—

2 HOUSE PHYSICIANS.
2 HOUSE SURGEONS

Further particulars and form of application, which must be returned not later than 2nd May, 1955, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 15th July, 1955, for a JUNIOR RESIDENT ANÆSTHETIST (Senior House Officer).

Full particulars, with form of application, which must be returned not later than Monday, 2nd May, 1955, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY, 91, Dean-street, W.1. Applications are invited for the resident post of SENIOR HOUSE PHYSICIAN (Senior House Officer), organic neurology, commencing 1st May, 1955.

Applications, stating age, qualifications, experience, together with names and addresses of 2 referees, to be forwarded to Hospital Secretary by 12th April, 1955.

WEST LONDON HOSPITAL, Hammersmith-road, W.6. HOUSE SURGEON (general and gynæcological) required 1st June. Pre-registration candidates considered.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary by 14th April.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of Locum Tenens RESIDENT MEDICAL OFFICER (Female) at Parkwood Auxiliary Hospital and Convalescent Home, Swanley, Kent, for 1 year in first instance and renewable. Post vacant now, graded as Junior Hospital Medical Officer, and includes duties in outpatient clinics at Westminster Hospital. A deduction of £195 p.a. will be made from salary for board-residence.

Applications (4 copies), with names of 2 referees, to House Governor by 12th April.

WILLESDEN GENERAL HOSPITAL, N.W.10. Clinical ASSISTANT to Medical Outpatients required at the above Hospital. 2 sessions per week—Tuesday and Friday mornings. Annual appointment; present holder is applying. General practitioner grade.

Applications, stating full particulars and 2 testimonials, to the Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 12th April, 1955.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited for the post of HOUSE SURGEON (pre-registration) in the Orthopædic Department of above Hospital.

Application forms from the Hospital Secretary, to be returned by 14th April, 1955.

ALTON GENERAL HOSPITAL. (121 Beds.) Winchester GROUP OF HOSPITALS. HOUSE SURGEON (Senior House Officer grade) required to assist in steadily expanding surgical work including casualty at this Hospital which is being developed. Post vacant 14th May.

Applications, with copies of 2 testimonials, to be sent to the Group Secretary, Royal Hampshire County Hospital, Winchester.

ASCOT. HEATHERWOOD ORTHOPÆDIC HOSPITAL. (212 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Orthopædics (whole-time), temporary post for 1 year. Hospital is a regional centre for all general orthopædic conditions, and may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 12th April.

BEDFORD GENERAL HOSPITAL. (437 Beds.) Locum RESIDENT CASUALTY OFFICER (Registrar grade) required 1st May, pending permanent appointment. Salary £17 10s. per week.

Applications, stating age, nationality, qualifications, previous appointments, together with copies of 2 recent testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by not later than 7th April.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street, BIRMINGHAM, 3. Required, SENIOR HOUSE OFFICER or HOUSE OFFICER (including pre-registration), according to experience.

Detailed applications, with copies of 2 recent testimonials, to the Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. HOUSE SURGEON (pre-registration) required 1st May, 1955. Recognised for F.R.C.S. 1 of 3 surgical units of approximately 85 general beds under 2 Consultant Surgeons.

Applications, with copies of 2 recent testimonials, to Secretary.

BIRMINGHAM EYE HOSPITAL, Birmingham, 3. OPHTHALMOLOGIST (Registrar), Research Department to assist in experimental physiology and clinical research. Opportunity to work for higher degree.

Application forms from Secretary, Dudley Road Hospital, Birmingham, 18, to be returned before 18th April, 1955. Candidates may visit Hospital.

BIRMINGHAM (SANATORIA) GROUP HOSPITAL MANAGEMENT COMMITTEE. YARDLEY GREEN HOSPITAL. THORACIC SURGICAL UNIT. Applications are invited for the post of SENIOR HOUSE OFFICER or HOUSE OFFICER according to experience. The appointment will give broad opportunities for experience in both tuberculous and non-tuberculous thoracic surgery.

Applications, stating age, qualifications, training, and experience, together with copies of 3 recent testimonials, should be addressed to the Group Secretary, Yardley Green Hospital, Birmingham, 9.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. HOUSE SURGEON (pre-registration) obstetrics. General Hospital. 5 other resident medical staff.

Apply Medical Superintendent.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM AND MIDLAND HOSPITALS FOR WOMEN (Incorporating the Hospital for Women and the Birmingham Maternity Hospital), Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. Applications are invited for the post of RESIDENT OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR vacant 1st July, 1955. The successful candidate will be required to alternate duty at the Hospital for Women and the Maternity Hospital, for specified periods. The post is recognised for the M.R.C.O.G., and applicants should have held House appointments and at least 1 obstetrical and gynæcological post.

Forms of application may be obtained from, and should be returned not later than 18th April, 1955, to, the House Governor at the above address. G. A. PHALP, Secretary.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (clinical pathology), vacant on 1st May, 1955, for 1 year. Applicants should have held resident appointments in a children's hospital or a children's department of a general hospital. The successful candidate will be required to work in the Clinical Pathological Department.

Forms of application may be obtained from the House Governor and should be returned by 15th April, 1955.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the post of ASSISTANT RESIDENT MEDICAL OFFICER (Senior House Officer), vacant 15th August, 1955, for 1 year. Main duty to take charge of Infants Block (66 Cots). Previous hospital experience of diseases of infancy is desirable and preference will be given to candidates holding the M.R.C.P.

Forms of application may be obtained from the House Governor, and should be returned by 23rd April, 1955.

G. A. PHALP, Secretary to the Board of Governors.

BISHOP AUCKLAND GENERAL HOSPITAL. (350 Beds.) SOUTH WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE. RESIDENT ANÆSTHETIST (Senior House Officer) required.

Apply, naming 2 referees, to—

K. G. T. LUXFORD, Group Secretary/Finance Officer.

The General Hospital, Bishop Auckland, co. Durham.

BISHOP'S STORTFORD AND DISTRICT HOSPITAL, Rye-street, BISHOP'S STORTFORD, HERTS. (67 Beds—medical, surgical and maternity. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for RESIDENT HOUSE OFFICER (not pre-registration). Appointment to commence 7th May, 1955.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or names of referees, should be sent to the Hospital Secretary, Haymeads Hospital, Bishop's Stortford, Herts.

BRADFORD, YORKSHIRE. THE ROYAL EYE AND EAR HOSPITAL. (105 Beds.) SENIOR HOUSE OFFICER required for E.N.T. Department of 56 Beds. Recognised for D.L.O. and F.R.C.S. Salary £745 p.a., less £150 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE GROUP HOSPITALS. (78 Beds.) SENIOR HOUSE OFFICER for duties in the E.N.T. Department of the above Group. Recognised for F.R.C.S. and D.L.O.

Applications, with details of experience, &c., together with the names of 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. NEW SUSSEX HOSPITAL FOR WOMEN, Windlesham-road. Locum HOUSE SURGEON (Senior House Officer) required for month 23rd May–19th June, inclusive. Salary at the rate of £14 10s. per week.

Applications, with full details, to the Administrative Officer as soon as possible.

BRIGHTON. SUSSEX EYE HOSPITAL, Eastern-road, BRIGHTON, 7. (56 Beds.) SENIOR HOUSE SURGEON (Senior House Officer) and HOUSE SURGEON (House Officer) required mid-April. Posts recognised for F.R.C.S. under 23 (b).

Applications, stating age, qualifications and experience, together with the names of 2 referees, to the Administrative Officer.

BRISTOL CLINICAL AREA. The Board of Governors OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR to the Department of General Surgery for the Cossham-Frenchay Hospitals Group, Bristol. The appointment will be held for 1 year in the first instance, and be renewable for a further year.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 13th April, 1955.

BURY AND ROSSENDALE HOSPITAL MANAGE- MENT COMMITTEE. BURY GENERAL HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in Anæsthetics (resident or non-resident). The post, which will be limited to a tenure of 4 years in the first instance, is based on Bury General Hospital, but will include duties at other hospitals in the Group, and provides wide experience. The anæsthetic staff comprises, in addition, a Consultant and a Senior Hospital Medical Officer.

Apply, stating age, qualifications, experience, and names of 2 referees, to H. WILKINSON, Group Secretary.

Bury General Hospital Bury, Lancs.

CANTERBURY. KENT AND CANTERBURY HOS- PITAL. (276 Beds.) The post of GENERAL SURGICAL AND ORTHOPÆDIC HOUSE SURGEON, which is recognised for the F.R.C.S. Diploma, becomes vacant early May, 1955. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOS- PITAL. (276 Beds.) The post of OBSTETRIC HOUSE SURGEON, which is recognised for the M.R.C.O.G. and D.Obst. R.C.O.G., becomes vacant early May, 1955. National Health Service salary and conditions.

Applications, together with 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOS- PITAL. (276 Beds.) GYNÆCOLOGICAL HOUSE SURGEON required at Highland Court Annexe, a unit of 25 gynæcological beds situated 3 miles from the above Hospital, with all ancillary services available. Recognised for M.R.C.O.G. 6 months appointment. Post vacant mid-May, 1955. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOS- PITAL. (276 Beds.) The post of GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON (pre-registration, first, second, or third post), which is recognised for the F.R.C.S., becomes vacant in early April, 1955. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF ISOLATION HOSPITAL. Cardiff Hospital MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident) required at above Hospital.

Apply immediately to Group Secretary, 44, Cathedral-road, Cardiff.

CARDIFF. UNITED CARDIFF HOSPITALS. Applications are invited for the post of REGISTRAR in Orthopædics at the Cardiff Royal Infirmary. Large Orthopædic and Traumatic Department in charge of 2 Consultant Orthopædic Surgeons with undergraduate teaching.

Application forms obtainable from Secretary, Cardiff Royal Infirmary.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Regis-TRAR (radiology) required. Application may be made by candidates who are about to sit for the April D.M.R. examination. Opportunities for experience in varied specialties.

Apply, with full particulars and names of 3 referees, to Secretary by 15th April.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. (711 Beds.) SENIOR HOUSE OFFICER to the Obstetric and Gynæcology Department (105 obstetric and 30 gynæcological beds). Post vacant 24th May. Appointment for 6 months, renewable for a further 6 months. Post recognised for both obstetrics and gynæcology for the M.R.C.O.G.

Applications, giving age, qualifications and experience, and names and addresses of 2 referees, together with recent testimonials, to the Group Secretary, St. Helier Hospital, by 16th April.

CHELMSFORD AND ESSEX HOSPITAL. Applications are invited for the resident post of CASUALTY OFFICER (Senior House Officer). It is recognised for the F.R.C.S. and offers excellent experience in the treatment of fractures and diagnosis of acute medical and surgical emergencies. Opportunity is given for Casualty Officer to follow up his cases in the wards and to obtain operating experience in major theatre under the guidance of the Consultants or the Resident Surgical Officer. Off duty time is generous and the post is one likely to suit both an officer seeking a higher qualification in surgery or one intending General Practice. The vacancy will occur on 1st April. Salary £745 p.a., with £130 deducted for residential emoluments.

Apply Secretary, Chelmsford Hospital Management Committee, Chelmsford and Essex Hospital, Chelmsford.

CHELMSFORD AND ESSEX HOSPITAL. (162 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON (pre-registration post). The post will become vacant on 16th April, and offers good surgical experience and is recognised for the F.R.C.S.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHERTSEY, SURREY. BOTLEYS PARK HOSPITAL. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (psychiatry). This modern mental deficiency hospital of 1550 Beds provides full facilities for patients of all grades. Recognised for 12 months of the 2-year qualifying period for D.P.M. Opportunity of experience at nearby mental hospitals and child guidance clinic. Accommodation available for single person.

Application forms obtainable from the Secretary to the Hospital Management Committee.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botleys Park War Hospital). (404 Beds.) ORTHOPÆDIC HOUSE SURGEON required from 23rd April. Senior House Officer or House Officer (Intern) grade. Post recognised for F.R.C.S. or for pre-registration internship. Preference will be given to provisionally registered candidates. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent as soon as possible.

CHERTSEY. ST. PETER'S HOSPITAL. (404 Beds.) ORTHOPÆDIC REGISTRAR required. Post recognised for F.R.C.S. Hospital may be visited by arrangement with Physician-Superintendent (Tel. : Ottershaw 441).

Application forms from Secretary, Woking and Chertsey Hospital Management Committee, "Huntington," Chertsey, Surrey. Closing date 12th April.

CHESTERFIELD ROYAL HOSPITAL. (324 Beds. Recognised for the D.A. and F.F.A.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (anæsthetics) with additional duties when required at other hospitals in the Group. Experience in all types of anæsthesia, except for neurosurgery, can be obtained in this Group of hospitals. Post becomes vacant 14th April. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th April, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

COLCHESTER HOSPITAL MANAGEMENT COM-MITTEE. Applications are invited for the following posts :—

Essex County Hospital, Colchester (188 Beds)

SENIOR HOUSE OFFICER (Casualty and Radiotherapy Departments).

SENIOR HOUSE OFFICER (Casualty and E.N.T. Departments).

Posts tenable for 6 months or 1 year. Recognised for F.R.C.S.

Clacton and District Hospital, Clacton-on-Sea (58 Beds)

SENIOR HOUSE OFFICER (Resident Surgical Officer).

Post tenable for 1 year.

Applications, with copies of 3 testimonials, to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

CREWE MEMORIAL HOSPITAL. South Cheshire HOSPITAL MANAGEMENT COMMITTEE. Locum ANÆSTHETIST required from 12th April for 1 month. Salary according to grading.

Applications and full particulars to Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich.

CROYDON. MAYDAY HOSPITAL. (618 Beds.) House SURGEON (pre-registration post) for period of 6 months, vacant shortly. Post recognised for F.R.C.S. Preference given to candidates who have held previous House Officer post.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned immediately.

CHELTENHAM GENERAL AND EYE HOSPITAL. (170 Beds.) HOUSE SURGEON (pre-registration or otherwise) required.

Applications, together with the names of 2 referees, to be sent to the Group Secretary, General Hospital, Cheltenham.

DONCASTER ROYAL INFIRMARY. (330 Beds.) Don-CASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT ANÆSTHETIST in the grade of Senior House Officer.

Applications to the Secretary to the Committee at Doncaster Royal Infirmary.

DORKING GENERAL HOSPITAL, Horsham-road, DORKING. SENIOR HOUSE OFFICER (general surgery, orthopædics, and E.N.T.), vacant end April, 1955.

Apply, with 2 testimonials, to the Medical Superintendent.

DRIFFIELD, YORKSHIRE. NORTHFIELD SANA-TORIUM. (78 Beds.) SENIOR HOUSE PHYSICIAN, vacant now. Offers experience all branches of tuberculosis within Group, including surgery, M.M.R., and clinics. Time for study. Ex-patients welcome. £165 for full residence.

Applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DURHAM. COUNTY HOSPITAL. (116 Beds.) House SURGEON in Orthopædics and Casualty required. This post is recognised for pre-registration purposes and is vacant now. The County Hospital is the main Orthopædic and Accident Hospital in a busy mining and industrial area. Experience can be obtained in all branches of orthopædics.

Applications, with particulars of previous experience, and names of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

DURHAM. DRYBURN HOSPITAL. (309 Beds.) Applications are invited from fully registered medical practitioners for the post of HOUSE OFFICER in General Medicine at Dryburn Hospital. Post vacant now. This post will provide good experience in the treatment of acute and chronic medical cases.

Applications, with particulars of previous experience and names of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

EDGWARE GENERAL HOSPITAL. (715 Beds.) Resident SENIOR HOUSE OFFICER in Pathology required at above Hospital, vacant 1st May, 1955. Salary £745 p.a. Deduction of £130 p.a. for board, lodging, &c.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 16th April, 1955.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT SENIOR CASUALTY HOUSE OFFICER required at above Hospital. Salary £745 p.a. ; deduction of £155 p.a. for board, residence, &c.

Apply immediately, stating age, nationality, qualifications and experience, together with the names of 2 referees, to Group Secretary, Edgware General Hospital.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT HOUSE PHYSICIAN for Thoracic and Dermatological Departments. Duties to include "taking of acute general medical cases." Post vacant 18th May, 1955. 6 months appointment.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 16th April, 1955.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) 2 RESIDENT HOUSE SURGEONS for above Hospital. Posts vacant 1st and 14th May, 1955. 6 months appointments. Posts recognised for pre-registration and F.R.C.S. purposes.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 16th April, 1955.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT GYNÆCOLOGICAL HOUSE SURGEON for above Hospital. Post vacant 23rd May, 1955. Post recognised for M.R.C.O.G. purposes.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 16th April, 1955.

GAINSBOROUGH. JOHN COUPLAND HOSPITAL. (40 Beds.) LINCOLN NO. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT MEDICAL OFFICER at the above Hospital. The Hospital has a number of both medical and surgical beds. Salary is in accordance with Junior Hospital Medical Officer grade of the terms laid down for hospital medical and dental staffs. Married quarters are available.

Applications, giving full particulars, should be forwarded as soon as possible to R. W. HOWICK, Group Secretary, County Hospital, Lincoln.

GLASGOW. ROYAL HOSPITAL FOR SICK CHILDREN, YORKHILL, GLASGOW. Applications are invited for the posts (2) of SENIOR HOUSE OFFICER (resident) in Surgical Pædiatrics at the above Hospital. National Health Service salary and conditions of service.

Applications, with names of 3 referees, to be lodged with the Secretary, Board of Management for Glasgow and District Children's Hospitals, 86, St. Vincent-street, Glasgow, C.2, by 16th April.

GRIMSBY GENERAL HOSPITAL. Grimsby Hospital MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER for casualty duties required 8th April, 1955. Resident post. Recognised by Royal College of Surgeons for Final Fellowship examination. Hours : 9 A.M.–6 P.M. Monday–Friday ; 9 A.M.–12 P.M. Saturday. The Hospital possesses a well-equipped medical library.

Applications, with names and addresses of 2 referees, to the Hospital Secretary, Grimsby General Hospital.

GRIMSBY GENERAL HOSPITAL. Grimsby Hospital MANAGEMENT COMMITTEE. Applications are invited for the post now vacant, of SENIOR HOUSE OFFICER (orthopædic). Locum would be considered.

Applications, with names and addresses of 2 referees, to Hospital Secretary, Grimsby General Hospital.

HALIFAX GENERAL HOSPITAL. (425 Beds.) Junior HOSPITAL MEDICAL OFFICER in Anæsthetics required. Board-residence available.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ST. JOHN'S HOSPITAL. Senior House OFFICER in Geriatrics and General Medicine required. Good facilities for modern method of treating geriatric cases.

Applications to the Group Secretary, Royal Halifax Infirmary, Halifax.

HASTINGS. ST. HELEN'S HOSPITAL. (497 Beds.) HOUSE SURGEON required. Resident pre-registration post vacant now. Male or Female. National scale of salary.

Apply to Hospital Administrator.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) RESIDENT CASUALTY OFFICER (Senior House Officer grade) with attachment to Pædiatrician and Ophthalmic Consultant. Salary £745 p.a., less £130 p.a. residential emoluments. Recognised under F.R.C.S. regulations. Appointment to commence 1st May, 1955.

Apply, with full details and references, to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HEREFORD GENERAL HOSPITAL. (154 Beds—71 surgical.) HOUSE OFFICER (general surgery). Post vacant 1st May. Hospital recognised by Royal College of Surgeons.

Applications, with copies of 2 recent testimonials, to the Secretary, Hospital Management Committee, Victoria House, Eign-street, Hereford.

HITCHIN, HERTFORDSHIRE. NORTH HERTS HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics and Gynæcology (42 obstetric beds and 20 gynæcological beds). The appointment is for 1 year from 1st May, 1955, and is recognised for the D.Obst.R.C.O.G. Some experience in obstetrics is an advantage but not essential.

Applications, stating age, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator, Hitchin Hospitals, Lister Hospital, Hitchin, Herts, as soon as possible.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. Applications are invited for the post of RESIDENT HOUSE SURGEON at the North Herts Hospital, vacant 26th April, 1955. Recognised for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator, Lister Hospital, Hitchin, Herts.

HOVE, SUSSEX. THE LADY CHICHESTER HOSPITAL, New Church-road. (70 Beds.) Applications invited for post of JUNIOR HOSPITAL MEDICAL OFFICER at above Hospital, a Neurosis Centre for men, women and children with Outpatients Department. The post is resident and accommodation is only available for a single person. Salary £775 p.a. rising by annual increments to £1075 p.a., less a charge of £150 p.a. for board-residence. Conditions of service in accordance with national recommendations.

Applications, stating nationality, age, sex, qualifications and experience, together with the names of 3 referees, to the Secretary, Hospital Management Committee, St. Francis Hospital, Haywards Heath, Sussex.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (medical) at this Hospital which is approved by the licensing authority for Pre-registration Service. The selected candidate will be required to look after medical and pædiatric cases and may be called upon to give emergency anæsthetics. Post vacant towards the end of April.

Apply, with full particulars, and names of 2 referees, to Group Secretary, Hospital Management Committee Offices, Newmarket General Hospital, Newmarket, Suffolk.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (surgical) at this Hospital, which is approved by the licensing authority for Pre-registration Service. Post vacant towards the end of April.

Applications, giving full particulars, and names of 2 referees, to the Group Secretary, Hospital Management Committee Offices, Newmarket General Hospital, Newmarket, Suffolk.

ILFORD, ESSEX. KING GEORGE HOSPITAL. There will be a vacancy for a HOUSE PHYSICIAN (pre-registration second post) at the above Hospital on 5th May, 1955. The post will be tenable for 6 months.

Applications, giving full particulars and accompanied by testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Secretary,
Ilford and Barking Group Hospital Management Committee.
King George Hospital, Ilford.

IPSWICH BOROUGH GENERAL HOSPITAL, Heath-road, IPSWICH. (270 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Fracture and Orthopædic Department). The post, which is now vacant is normally of 1 years duration. It is recognised as part of the necessary surgical experience for the Final F.R.C.S.

Applications, stating age, qualifications and experience, together with recent testimonials to the Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (356 Beds.) Applications are invited for the post of SENIOR HOUSE SURGEON to the Fracture and Orthopædic Department. The post is graded Senior House Officer and is recognised for the F.R.C.S. examinations. The Department has 2 Consultants, about 60 beds, and a large outpatient attendance; it offers wide experience.

Applications, stating age, nationality, and experience, together with copies of recent testimonials, to Hospital Secretary.

LEEDS, 2. PUBLIC DISPENSARY AND HOSPITAL. LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER (Senior House Officer) at the above Hospital. The appointment will be for a period of 1 year. Salary in accordance with the agreed terms and conditions of service of hospital medical and dental staffs, with an appropriate deduction in respect of board, lodging, &c.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.
Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS, 9. ST. JAMES'S HOSPITAL. Leeds A Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the appointment of SENIOR HOUSE OFFICER (orthopædics). The appointment, which is recognised by the Royal College of Surgeons for Fellowship, will be for a period of 1 year and the salary will be in accordance with the agreed terms and conditions of service of hospital medical and dental staffs—namely, £745 p.a. with an appropriate deduction in respect of board, lodgings and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.
Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. SENIOR HOUSE OFFICER in Neurosurgery required for a period of 6 months from 1st May, 1955. The appointment will be renewable for a further period of 6 months. Terms and conditions of service for hospital medical staff apply.

Applications, giving details of age, qualifications, posts held with dates, and with 3 names for reference, should be sent to the Secretary to the Board as soon as possible.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. NEUROLOGICAL HOUSE SURGEON (pre-registration) required for 6 months from 1st May, 1955. Whitley Council conditions of service apply.

Applications, giving details of age, qualifications and experience, if any, with 2 names for reference, should be sent to the Secretary to the Board as soon as possible.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. REGISTRAR in Neurosurgery required. The main duties of the post are centred at the General Infirmary at Leeds but will include sessions at Regional Hospitals. Whitley Council salary scale applies.

Applications, stating age, qualifications, experience with dates, and 3 names for reference, should be sent to the Sub-Dean, School of Medicine, Leeds, 2, as soon as possible.

LEEDS REGIONAL HOSPITAL BOARD. Short-term LOCUM TENENS appointments in the Registrar grade are constantly available at hospitals in the area of the Board, particularly in the specialties of anæsthetics, general medicine, general and orthopædic surgery, and psychiatry.

Interested practitioners, suitably experienced, should communicate with the Secretary, Joint Registrars Committee, Park-parade, Harrogate.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts :—

Chest Diseases

Scotton Banks Sanatorium, Knaresborough (resident), 306 Beds. Visiting staff includes Teaching Hospital Consultants.

Geriatrics

Bradford A and B Groups. Work primarily with Consultant Geriatrician in Admission Unit at St. Luke's Hospital, with additional duties at Thornton View Hospital. Offers excellent experience of an area geriatric service. Aggregate of 728 Beds.

General Surgery

(*a*) York A and Tadcaster Group (resident or non-resident) for duties mainly at York County and City Hospitals. Aggregate of 150 general surgical and 50 orthopædic surgery beds. Duties approximately divided between general and orthopædic surgery.

(*b*) Halifax General Hospital (50 surgical beds) and Halifax Royal Infirmary (60 orthopædic beds). Duties approximately divided between general and orthopædic surgery (preferably resident).

Psychiatry

(*a*) Broadgate Hospital, Beverley (600 Beds). Accommodation for single person (resident or non-resident).

(*b*) Menston Hospital, near Leeds (2500 Beds). Resident.

If desired facilities for attendance at the Leeds University will be provided if the successful candidates are studying for the D.P.M.

Thoracic Surgery

Regional Thoracic Centre (56 Beds), Pinderfields General Hospital, Wakefield. Previous experience in thoracic work desirable. The beds are under the charge of the Consultants to the Teaching Hospital and the post may in future be linked with the Unit at the General Infirmary at Leeds (resident, married quarters available).

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 5th April, 1955.

LEEDS REGIONAL HOSPITAL BOARD. Medical ACT, 1950. RESIDENT HOUSE OFFICER posts. Recognised pre-registration House posts will be available for the 6 months commencing 1st May, 1955, in the following hospitals approved under the Medical Act, 1950.

Scarborough Hospital (191 Beds)
1 General Surgical.
1 Surgical (general surgery, E.N.T. and orthopædic).
1 Surgical (obstetric, gynæcology and opthalmology).

County Hospital, York (222 Beds)
2 Surgical (general surgery and gynæcology). Recognised for F.R.C.S.
1 Medical.

City Hospital, York (178 Beds)
1 Medical.

Hull Royal Infirmary and Sutton (218 Beds)
1 General Surgical.
1 Surgical (general surgery and gynæcology). Recognised for F.R.C.S.
1 Surgical (E.N.T.). Recognised for D.L.O.
1 Surgical (ophthalmology). Recognised for D.O.M.S.
1 Medical.

Kingston General Hospital, Hull (398 Beds)
1 Surgical (general surgery, gynæcology, and E.N.T.).

Victoria Children's, Hull (143 Beds) (all posts recognised for D.C.H.)
1 General Surgical.
1 Surgical (general surgery and orthopædic).
1 Medical.
Vacant about 1st June.

Westwood Hospital, Beverley (229 Beds)
1 Surgical (orthopædic). Recognised for F.R.C.S.
1 Medical.

East Riding General, Driffield (247 Beds)
1 Medical.

Clayton Hospital, Wakefield (200 Beds)
1 Surgical (general surgery and orthopædic).
1 Surgical (general surgery, E.N.T. and ophthalmology). Recognised for F.R.C.S.

General Hospital, Wakefield (158 Beds)
1 Medical (general medical and pædiatric). Recognised for D.C.H.

Pinderfields General, Wakefield (663 Beds)
1 General Surgical.
1 Surgical (thoracic).
1 Surgical (gynæcology).
1 Surgical (orthopædic).
1 Medical.
1 Medical (neurology).

General Hospital, Batley (99 Beds)
1 Surgical (orthopædic and ophthalmology), vacant 10th June, 1955.
1 Surgical (general surgery and E.N.T.).

General Hospital, Dewsbury (119 Beds)
1 Medical (general medical, pædiatric and dermatology).
1 Surgical (general surgery and E.N.T.).

Staincliffe General, Dewsbury (314 Beds)
1 Surgical (general surgery, orthopædic and E.N.T.).
1 Surgical (obstetric and gynæcology).

Huddersfield Royal Infirmary (305 Beds)
1 Medical (general medical and dermatology), vacant 1st June, 1955.

Princess Royal Maternity, Huddersfield (60 Beds)
1 Midwifery (recognised by R.C.O.G.).

Royal Halifax Infirmary (301 Beds)
1 Surgical (E.N.T. and ophthalmology).
2 Medical.

Halifax General Hospital (425 Beds)
2 Medical.

Bradford Royal Infirmary (507 Beds)
1 Surgical (general surgery and urology).
2 Surgical (orthopædic and casualty). Recognised for F.R.C.S.

St. Luke's Hospital, Bradford (828 Beds)
1 Surgical (general surgery and plastic). Recognised for F.R.C.S.
1 Medical (pædiatric).

Otley General Hospital (170 Beds)
1 Medical (general medical and pædiatric).

St. James's Hospital, Leeds (1539 Beds)
3 General Surgical (recognised for F.R.C.S.).
1 Surgical (orthopædic).
1 Surgical (plastic).
1 Surgical (urology).
1 Surgical (E.N.T. and ophthalmology).
7 Medical.
1 Medical (geriatric).
1 Medical (pædiatric).
1 Medical (dermatology).
1 Midwifery (recognised by R.C.O.G.).

St. Mary's Hospital, Leeds (216 Beds)
1 Midwifery (recognised by R.C.O.G.).

Seacroft Hospital, Leeds (60 pædiatric and 60 child surgical beds)
1 Surgical (child general surgery, E.N.T. and ophthalmology).
2 Medical (pædiatric).

Harrogate General Hospital (249 Beds)
2 General Surgical (recognised for F.R.C.S.).

Candidates should express, where applicable, their preference for medical, surgical or midwifery posts within the same hospital on the application form.

Candidates wishing to apply for posts at more than 1 hospital should complete a separate form in respect of each hospital.

Application forms can be obtained from the Senior Administrative Medical Officer, Leeds Regional Hospital Board, Park-parade, Harrogate, or from the Dean, School of Medicine, Thoresby-place, Leeds, 2, and should be returned to either of the above-named as soon as possible. Application may be made in advance of results of final examination.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) Applications are invited for HOUSE OFFICER (anæsthetics). The post is recognised for D.A.

Applications to Hospital Secretary.

LEICESTER ISOLATION HOSPITAL AND CHEST UNIT, Groby-road, LEICESTER. (328 Beds.) Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (surgical). Salary £745 p.a., less £150 p.a. residential emoluments. The appointment is tenable for 6 months and may be extended for a further period of 6 months. Experience will be gained in all branches of thoracic surgery including cardiac surgery.

Applications, giving age, qualifications, dates, &c., and copies of 2 recent testimonials, to be forwarded as soon as possible to the Department of Thoracic Surgery, Leicester Isolation Hospital and Chest Unit.

LIVERPOOL (near). MOSS SIDE HOSPITAL, Maghull, near LIVERPOOL. (460 Beds for mental defectives exhibiting conduct disorders.) RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER (tenure 3 years) or REGISTRAR. Hospital recognised for D.P.M. training.

Applications, naming 3 referees, to Medical Superintendent by 16th April, 1955. Candidates may visit Hospital by appointment.

LUTON, BEDFORDSHIRE. ST. MARY'S HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER at St. Mary's Hospital, Luton (129 Beds mainly for chronic sick and 33 Beds for chest diseases), vacant 14th April, 1955. The post includes outpatient work in the chest clinic.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, should be sent to the Secretary, Luton and Hitchin Hospital Management Committee, St. Mary's Hospital, Luton, Beds., as soon as possible.

LUTON CHEST CLINIC, Grove-road, Luton. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (resident preferred), required 25th April, 1955, at the above Clinic. Appointment will include duties in attached medical wards in St. Mary's Hospital, at Hitchin Chest Clinic, and attendance at sessions for minor thoracic surgery. Good training in general medicine as well as experience in treatment of tuberculosis and diseases of the chest essential. Successful candidate would be encouraged to pursue further postgraduate studies. Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds., by 11th April, 1955.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the E.N.T. Department of the above Hospital. Post vacant April, 1955. There are 55 E.N.T. beds and 6 specialist operating sessions each week. Valuable experience is available, and the post is recognised for the purpose of the F.R.C.S. and the D.L.O. Salary will be £745 a year, less £150 a year for residential emoluments.

Applications immediately to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Maidstone, Kent.

MANCHESTER REGIONAL HOSPITAL BOARD. Blackburn AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT REGISTRAR (obstetrics/gynæcology) required. Post recognised for M.R.C.O.G. Based on Queen's Park Hospital, Blackburn (a general hospital with 83 obstetrics/gynæcology beds) with duties at Blackburn Royal Infirmary and Accrington Victoria Hospital. Accommodation for married man and small family available if required.

Application forms obtainable from, and returnable to, the Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Chest Diseases, the main duties to be with the Bury and Rossendale Hospital Management Committee, with duties at Chest Clinics and at Aitken Sanatorium and Peel Hall Pulmonary Hospital, and other hospitals in the area.

Apply, stating names of 2 referees, to—
H. WILKINSON, Group Secretary.
Bury General Hospital, Bury, Lancs.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for SENIOR HOUSE OFFICER post. Salary £745 p.a., less £155 p.a. for residential emoluments.

Application forms may be obtained from the undersigned.
H. R. NORTH, General Superintendent.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE.

Park Hospital, Davyhulme (General Hospital—433 Beds)
1 HOUSE OFFICER (pædiatrics), post-registration, for newly created post. The Hospital has a Midwifery Unit of 73 Beds and there are also thoracic surgery beds on the Pædiatric Unit. Hospital recognised for training for Diploma in Child Health.

Eccles and Patricroft Hospital (General Hospital—48 Beds)
1 HOUSE OFFICER (post-registration). Post vacant 1st May, 1955. Additional allowance of £50 p.a. The work of the Hospital is mainly surgical and there is a busy outpatient Department.

Forms from Secretary, Park Hospital, Davyhulme.

MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. Temporary REGISTRAR in Obstetrics and Gynæcology required for 3 months or possibly longer. Salary scale £850/£965 p.a., according to experience.

Apply, with full details and testimonials, to Group Secretary, Medway and Gravesend Hospital Management Committee, 20, Star-hill, Rochester, Kent.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead. Applications invited from fully registered practitioners for post of HOUSE PHYSICIAN, vacant 1st June.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to Hospital Secretary.

NEWCASTLE GENERAL HOSPITAL. Newcastle upon TYNE HOSPITAL MANAGEMENT COMMITTEE. DEPARTMENT OF OBSTETRICS. (70 Beds.) The resident post of OBSTETRICAL HOUSE SURGEON becomes vacant on 1st May, 1955. This post is recognised for the purpose of Pre-registration Service and preference will be given to provisionally registered persons who have served 6 months in a medical or surgical post since qualification. The department is recognised for the Diploma of M.R.C.O.G., and D.Obst.R.C.O.G., and undertakes the training of Medical Students in the University of Durham.

Applications should be addressed to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, together with 1 copy of 2 recent testimonials, by 16th April, 1955.

NEWCASTLE REGIONAL HOSPITAL BOARD.
Newcastle upon Tyne and Hexham Hospital Management Committee

REGISTRAR OBSTETRICIANS AND GYNÆCOLOGISTS (2), whole-time, resident. 1 appointment to commence 1st June, 1955; the other later. 3 Registrars are attached to a combined unit including Newcastle General Hospital (66 obstetric, 34 gynæcological beds), Hexham General Hospital (25 gynæcological beds) and Dilston Hall Maternity Hospital, Corbridge (53 obstetric beds). Each Registrar is required to spend 6 months resident at Dilston Hall Maternity Hospital. Newcastle General Hospital is recognised for the M.R.C.O.G. and is associated with King's College for the training of medical students in the instruction of whom Registrars take an active part.

Sunderland Area Hospital Management Committee

SENIOR REGISTRAR PHYSICIAN (whole-time) for the Geriatric Service in the above Group. Appointment for 1 year initially and subject to annual review up to 4 years duration.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. TEESSIDE HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR REGISTRAR GENERAL SURGEON (whole-time) to 30th June, 1955.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, immediately.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the whole-time non-resident appointment of SURGICAL REGISTRAR at the Royal Victoria Infirmary. The appointment will be for 1 year in the first instance and subject to the terms and conditions of service of hospital medical and dental staffs.

Applications, giving full particulars and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

NEWMARKET GENERAL HOSPITAL. (330 Beds.) EAST ANGLIAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR. Post recognised for D.A. Appointment for 1 year, renewable for second year.

Applications, stating age, experience and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 11th April, 1955. Candidates invited to visit Hospital by direct arrangement with Physician-Superintendent at the Hospital.

NEWPORT AND EAST MONMOUTHSHIRE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICERS in General Surgery required, towards end of April :—

County Hospital, Griffithstown (253 Beds), resident. Covers 35 Beds. Recognised F.R.C.S. for 6 months and tenable 6 or 12 months as desired. Deduction £130 board-residence.

St. Woolos Hospital, Newport (379 Beds), non-resident. Post of senior character. House Surgeon also appointed. Covers 56 Beds. Tenable 12 months.

Apply, quoting 2 referees and post preferred, to—
T. A. JONES, Group Secretary.
64, Cardiff-road, Newport, Mon.

NEWPORT, MONMOUTHSHIRE. ROYAL GWENT HOSPITAL. (260 Beds. 10 Residents. Recognised F.R.C.S.) SENIOR HOUSE OFFICER required for Casualty Department in early April. This is the base Hospital in the Group and all medical and surgical emergencies are admitted through casualty, which is under the full-time charge of a Senior Hospital Medical Officer, there being also 2 Senior House Officers. A new Department with excellent facilities and accommodation has recently been opened. Post recognised F.R.C.S. for 6 months and tenable 6 or 12 months as desired. Salary £745, less £125 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

NEWTON ABBOT HOSPITAL. (General Section 65 Beds.) RESIDENT SENIOR HOUSE SURGEON (Male or Female) required immediately. Married quarters available.

Applications (quoting reference F.364/28), stating qualifications, nationality, age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR (resident) required 1st July, 1955, for 1 year in the first instance at the North Herts Hospital, Hitchin, Herts (where he will reside), and the Lister Hospital, Hitchin. Post recognised for F.R.C.S. The hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds, by 22nd April, 1955.

NORTHAMPTON. ST. CRISPIN HOSPITAL, Duston, NORTHAMPTON. (1210 Beds.) SENIOR HOUSE OFFICER required. Salary according to national scale. A well-appointed flat is available at the Hospital at moderate rental. The Hospital is approved for training for the D.P.M. of the Conjoint Board and facilities are available in child psychiatry and outpatient clinics locally, and in neurology (at Oxford). There is a modern admission unit and an annual admission rate of 700 patients. Regular case conferences are held.

Applications, giving full details and names of 3 referees, to be sent to the Physician-Superintendent.

NORTH SHIELDS. PRESTON HOSPITAL. (358 Beds.) SOUTH EAST NORTHUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from practitioners qualified at least 1 year for the resident appointment of SENIOR HOUSE PHYSICIAN. Salary £745 p.a., less £140 p.a. for board-residence.

Applications to Group Secretary, Preston Hospital, North Shields.

NOTTINGHAM GENERAL HOSPITAL. (420 Beds. Post recognised for the F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR in E.N.T. Surgery. Appointment for 1 year in the first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th April, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of THIRD CASUALTY OFFICER (Senior House Officer grade). Salary (less £150 emoluments) and conditions of service in accordance with those laid down by the Ministry. Duties to commence on or about 9th April, 1955. This post offers wide experience of casualty work. The staff establishment requires only 1 night in 3 emergency work, and off duty permits time for study for higher examinations.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to—
HENRY M. STANLEY.

OXFORD. UNIVERSITY OF OXFORD. Oxford REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in Psychiatry at Littlemore Hospital, Oxford. The successful candidate (who should hold the D.P.M. or its equivalent) may be asked to spend part of the tenure at other mental hospitals in the Region. There are facilities for postgraduate study, University teaching and psychiatric outpatient work. Residential accommodation available for single person. Further information may be obtained from the Physician-Superintendent.

Applications on forms obtainable from the Secretary, Oxford Regional Hospital Board, 43, Banbury-road, Oxford, must reach him by 15th April, 1955.

OXFORD. UNITED OXFORD HOSPITALS. Applications are invited for the non-resident post of REGISTRAR in Dermatology, vacant 1st June, 1955. The appointment will be for 1 year and eligible for extension to 2 years.

Applications on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should reach him by 18th April.

PLYMOUTH CLINICAL AREA. The Board of Governors OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in Orthopædic and Traumatic Surgery. The appointment will be held for 1 year in the first instance and be renewable for a further year. The successful candidate will be appointed to work for the first year mainly at Mount Gold Orthopædic Hospital and the Traumatic Centre at the General Hospitals, Plymouth. The post is recognised for the F.R.C.S. England.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 13th April, 1955.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Royal Portsmouth Hospital

HOUSE OFFICER required in Orthopædic Department (104 Beds), vacant now.

Locum CASUALTY OFFICER (Senior House Officer grade) for 6 weeks from the end of March.

Queen Alexandra Hospital

SENIOR HOUSE OFFICER, E.N.T. Department (61 Beds), vacant now.

Saint Mary's Hospital

HOUSE SURGEON (20 general surgical beds, 20 thoracic beds, 10 radiotherapy beds), pre-registration, vacant now.

Applications, stating age, experience and qualifications, together with names of 2 referees, should be forwarded as soon as possible to L. C. ROGERS.
35, Grove-road South, Southsea.

ROCHFORD, ESSEX. GENERAL HOSPITAL. Applications are invited for the post of RESIDENT HOUSE OFFICER to the Obstetric and Gynæcological Department, pre-registration post. The Hospital has 70 maternity beds, a gynæcological ward of 25 beds and a premature baby unit of 8 cots. Post vacant 18th April, 1955, and is recognised for the D.Obst.R.C.O.G.

Applications, &c., to the undersigned by 8th April, 1955 (1 testimonial sufficient from candidates seeking first appointment).
J. C. FIELD, Secretary.

ROCHFORD, ESSEX. GENERAL HOSPITAL. Locum HOUSE OFFICER required for Obstetric and Gynæcological Department for a period of 2 weeks from 15th April, 1955. 70 maternity beds, a 25-bed gynæcological ward and 8 premature baby cots.

Applications immediately to the Secretary.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road. (139 Beds.) HOUSE SURGEON (Male) required, preferably second appointment.

Apply to the Hospital Secretary.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) SENIOR HOUSE OFFICER for the Regional Poliomyelitis Unit (27 Beds) and in general medicine, vacant from 1st May, 1955.

Apply to Medical Superintendent.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male), required from 19th April, 1955. (Post not approved for pre-registration purposes.)

Applications should be forwarded immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE PHYSICIAN (Male) required. (Post not approved for pre-registration purposes.)

Applications should be forwarded immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT HOUSE SURGEON (obstetric and Gynæcological Unit) which is now vacant. Pre-registration candidates may apply. The Unit comprises 40 obstetric and 35 gynæcological beds and is recognised for the Diploma and Membership of the Royal College.

Applications, stating age, nationality, qualifications, experience, and enclosing a recent testimonial and the names and addresses of 2 referees, to the Group Secretary, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT HOUSE SURGEON (Orthopædic Department) which is open to pre-registration candidates, and which becomes vacant at the end of April, 1955. The Department has 35 Beds and a large outpatient turnover.

Applications, stating age, nationality, qualifications, experience, and naming 2 referees, to the Group Secretary, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of Locum RESIDENT HOUSE SURGEON, Post vacant from now until 30th June.

Apply, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SALISBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR for the Area Pathological Service based on Salisbury General Infirmary. Post vacant mid-June.

Further details and application forms obtainable from, and must be returned to, the Group Secretary, Odstock Hospital, Salisbury, within 10 days of the appearance of this advertisement.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time non-resident post of SURGICAL REGISTRAR to the Inverness Hospitals.

Further particulars and application schedules can be obtained from the undersigned, with whom applications should be lodged by 23rd April, 1955.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

SENIOR REGISTRAR in Radiotherapy based at the Western Infirmary, Glasgow.
REGISTRAR in Radiodiagnosis based at the Royal Infirmary, Glasgow.
REGISTRAR in Tuberculosis based at Robroyston Hospital, Glasgow.
REGISTRAR in Bacteriology based at the Western Infirmary, Glasgow.
SENIOR REGISTRAR in Anæsthetics based at Stobhill Hospital, Glasgow.
SENIOR REGISTRAR in Anæsthetics based at Law Hospital, Carluke.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, by 30th April, 1955.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds. Recognised for F.R.C.S.) RESIDENT HOUSE SURGEON required about 20th April. Pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton, as soon as possible.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds.) SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time SURGICAL REGISTRAR from 27th May, 1955. Post will normally be tenable for 2 years, but subject to review at the end of the first year. Candidates may visit the Hospital, by arrangement, if they so desire.

Forms of application may be obtained from the undersigned to whom they should be returned not later than 12th April, 1955.

FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds.) RESIDENT HOUSE PHYSICIAN required about 24th April. Pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SHEFFIELD REGIONAL HOSPITAL BOARD. Temporary NON-RESIDENT SENIOR REGISTRAR (radiotherapy) required at the Sheffield National Centre for Radiotherapy, to fill a vacancy during the present incumbent's period of national service. Appointment for initial period of 1 year, which may be extended to 2 years. Applicants should possess D.M.R.T.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th April, 1955, giving age, nationality, qualifications, present and previous appointments with dates, date available, and naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT SENIOR REGISTRAR in Radiology required on 12th April, for approximately 9 notional half-days per week at the City General Hospital, Sheffield, and approximately 2 notional half-days per week at the Barnsley Hospitals. Candidates should hold a Diploma in Diagnostic Radiology. Appointment for 1 year in the first instance reviewable annually. It has been agreed between the Sheffield Regional Hospital Board and the Board of Governors of the United Sheffield Hospitals that subject to satisfactory work and progress the tenure of the appointment will be divided between the City General Hospital, Sheffield, and Barnsley Hospitals and the Teaching Hospitals.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th April, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum SENIOR HOUSE OFFICER (casualty) required, 1 of 2, for post vacant 1st April.

Applications, together with 2 testimonials, to Hospital Secretary.

SOUTHEND GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER to the Orthopædic and Fracture Departments. Post vacant 9th May, 1955. The Orthopædic and Accident Department of this Hospital is the centre for reference of all cases from a large surrounding area, and the post offers excellent experience in all aspects of orthopædic and traumatic surgery under the supervision of and with instructions from the Consultant-in-charge. Post recognised for the F.R.C.S.

Applications, stating age, qualifications and experience, together with copies of 3 recent testimonials, should be sent to the undersigned by 7th April, 1955.

J. C. FIELD, Secretary.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Psychiatric Registrars training scheme. Applications are invited for the appointment of REGISTRAR for 6 months periods at the hospitals of St. Ebba's, Horton, Long Grove, and The Manor in succession. Wide experience is available in all forms of psychosis, in neurosis, and in mental deficiency under modern methods of treatment. Special experience may be gained in the Mott Clinic for General Paralysis ; St. Ebba's Juvenile Unit, and in Mapother House, Long Grove, for acute psychosis ; also in the associate Observation Wards and Outpatient Departments. The appointment will be tenable from July, 1955. Salary, &c., in accordance with the agreed terms and conditions of service for hospital medical staff. For residents appropriate charges are made for full residential amenities. Candidates may visit the hospitals by appointment with the Physicians Superintendent.

Application forms may be obtained from the Group Secretary, St. Ebba's and Belmont Group Hospital Management Committee, Group Office, Belmont Hospital, Brighton-road, Sutton, Surrey, and completed forms (5 copies) should be returned to him within 2 weeks of the appearance of this advertisement.

STOCKPORT INFIRMARY, Stockport. (162 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Assistant Resident Surgical Officer), general and orthopædics. The post is recognised for the F.R.C.S.

Applications, stating age, experience, and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire.

STOCKPORT INFIRMARY. Stockport and Buxton HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics). The post may be resident or non-resident (preferably resident) and is recognised for the D.A. and F.F.A.R.C.S. There are facilities for study.

Applications, stating age, experience, and qualifications, together with copies of 2 testimonials, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, immediately.

STOCKPORT. STEPPING HILL HOSPITAL. (490 Beds.) Applications are invited for 2 posts of RESIDENT SENIOR HOUSE OFFICER (surgery), vacant 12th April and 1st May, 1955. The posts are recognised for the F.R.C.S.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire, immediately.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. VICTORIA HOSPITAL, SWINDON. Applications invited for post of RESIDENT SENIOR HOUSE OFFICER (anæsthetics) for the Swindon hospitals. Post is recognised for the D.A. Approved salary, conditions, &c.

Apply, with copies of 3 recent testimonials, to Secretary, 7, Okus-road, Swindon.

STOCKTON-ON-TEES. THE CHILDREN'S HOSPITAL, Durham-road, STOCKTON-ON-TEES. (84 Beds.) CLEVELAND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER. Salary and conditions of service in accordance with Ministry of Health regulations.

Applications, with copies of 2 recent testimonials, to be forwarded to the Group Secretary, West Lane Hospital, Middlesbrough, immediately.

STRATFORD-ON-AVON HOSPITAL. Locum Senior HOUSE OFFICER (Resident Medical Officer) required from 21st May to 18th June.

Applications to Hospital Secretary, Arden-street, Stratford-on-Avon.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (378 Beds.) Locum Tenens JUNIOR HOSPITAL MEDICAL OFFICER (resident) required for duties mainly at the above Hospital for gynæcological and obstetric work, for the period 30th April–14th May, 1955.

Applications to Secretary, Mid-Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. Applications invited for post of SENIOR HOUSE OFFICER to Special Unit for Juvenile Rheumatics. Scope for those interested in research, pædiatrics, rheumatology or cardiology, and previous experience in 1 or these desirable. Post now vacant and tenable for 6 months in first instance.

Applications, stating age, qualifications, experience with dates, with copies of 3 testimonials, to Hospital Secretary.

TREDEGAR, MONMOUTHSHIRE. ST. JAMES HOSPITAL (near Newport and Cardiff). (160 Beds for acute medical, obstetrics and geriatrics.) RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required by 11th April at above Hospital. Salary £425–£525, according to experience, less appropriate deductions for married quarters (if required).

Apply immediately to Group Secretary, Hospital Management Committee, St. Martin's-road, Caerphilly, Glam.

TORQUAY. TORBAY HOSPITAL. Resident Casualty OFFICER (Senior House Officer status) required 1st April, 1955. There is a complement of 5 Resident House Officers.

Applications (quoting reference F.955/53), stating qualifications, nationality, age, with copy testimonials, to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay.

TYNEMOUTH VICTORIA JUBILEE INFIRMARY. (108 Beds.) SOUTH EAST NORTHUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from pre-registration or registered practitioners for the post of HOUSE SURGEON. Candidates with suitable experience will be considered for appointment in Senior House Officer grade.

Applications to Group Secretary, Preston Hospital, Preston-road, North Shields.

WAKEFIELD. STANLEY ROYD HOSPITAL. (Complete Nurse Training School for Nervous and Mental Disorders.) Applications invited for position of JUNIOR HOSPITAL MEDICAL OFFICER, vacant from beginning of July, 1955. Salary scale £775–£50–£1075. A flat is available in the Hospital for a single person. The charge for this accommodation, board, lodging, laundry, &c., will be £155 p.a. Facilities are available to attend at Leeds University for the purpose of obtaining the D.P.M.

Address written applications, giving full particulars and details of training, experience, &c., together with 2 names and addresses for reference, to W. BOWRING, Group Secretary.

Victoria Chambers, Wood-street, Wakefield.

WALSALL HOSPITAL MANAGEMENT COMMITTEE. Locum HOUSE SURGEON required from Easter until end of July.

Applications to Group Secretary, General Hospital, Walsall.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. RESIDENT SENIOR CASUALTY OFFICER (Male or Female) required. Junior Hospital Medical Officer grade. The Casualty Department offers exceptional opportunities for the treatment and disposal of a large number of cases of wide variety and interest and is closely associated with the Orthopædic Department. The successful applicant will work under the supervision of the Consultant Orthopædic Surgeons.

Applications, with full details and the names of 2 referees, should be forwarded to the Secretary, Royal Albert Edward Infirmary, Wigan, as soon as possible.

WINDSOR. KING EDWARD VII HOSPITAL. Obstetric AND GYNÆCOLOGICAL HOUSE SURGEON required (Male or Female) for post vacant early May. Post recognised for both M.R.C.O.G. and D.Obst.R.C.O.G., not a pre-registration post. Successful candidate will be resident at Old Windsor Unit of the Hospital. Applicants required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates and copies of recent testimonials or names of 3 referees, to Hospital Secretary, by 7th April.

WINDYGATES, FIFESHIRE. CAMERON I.D. HOS-PITAL. RESIDENT HOUSE PHYSICIAN required for a period of 6 months. The post is recognised for Pre-registration Service. The Hospital consists of 100 infectious diseases beds including 12 for treatment of tuberculous meningitis, and 30 chronic sick beds.

Apply, with copies of 2 recent testimonials, to the Medical Superintendent, East Fife Hospitals Board of Management, 243A, High-street, Kirkcaldy.

WOLVERHAMPTON GROUP.

Wolverhampton Eye Infirmary (recognised for F.R.C.S. and D.O. examinations)

HOUSE OFFICER, vacant now.

Apply Secretary, The Royal Hospital, Wolverhampton.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR in Pædiatrics, Maelor General Hospital, Wrexham (591 Beds). Recognised for D.C.H. Resident/non-resident. Post vacant from 9th May, 1955.

REGISTRAR (obstetrics and gynæcology), Maelor General (591 Beds) and War Memorial Hospitals (230 Beds), Wrexham. (Total of 60 obstetric and gynæcological beds) : and Trevalyn Maternity Hospital, Rossett, near Wrexham (45 Beds). Resident.

REGISTRAR (general surgery), Pembroke County War Memorial Hospital, Haverfordwest (resident or non-resident).

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

YORKSHIRE. EAST RIDING HOSPITAL MANAGE-MENT COMMITTEE.

Broadgate Mental Hospital, Beverley, Yorks (650 Beds)

JUNIOR HOSPITAL MEDICAL OFFICER required.

Facilities for study. A flatlet is available in the Hospital.

Detailed applications to Group Secretary, Westwood Hospital, Beverley.

YORKSHIRE. EAST RIDING HOSPITAL MANAGE-MENT COMMITTEE.

Westwood Hospital, Beverley, Yorks (229 Beds)

ORTHOPÆDIC HOUSE SURGEON (first, second, or third post). Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply to Group Secretary.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a temporary whole-time post for 3–4 months as REGISTRAR in Radiotherapy at the Northern Ireland Radiotherapy Centre, Purdysburn, Belfast. The terms and conditions will be in accordance with the application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 18th April, 1955.

B.W.I. UNIVERSITY COLLEGE HOSPITAL OF THE WEST INDIES. Applications are invited for the post of REGISTRAR or SENIOR REGISTRAR in the Division of Surgery at the above-named Teaching Hospital which is in special relationship with the University of London. Applicants should possess a higher qualification in surgery. The appointment will be for 1 year in the first instance, subject to renewal. Salary is payable within the scale £800–£100–£1000/£1100–£100–£1400 p.a., depending on experience and qualifications. Single accommodation and board or a limited number of unfurnished flats for unmarried or married Officers, are provided at a deduction of £125 p.a. or 5% of salary, respectively. Return first-class passage by sea will be paid for 1 person only.

Further information may be obtained from the Hospital Manager and Secretary, University College Hospital, Mona P.O., Jamaica, B.W.I., to whom applications, stating age, nationality, and details of qualifications and experience, together with 3 recent testimonials or the names and addresses of 3 referees, and including the approximate date on which applicant could become available, should be sent by 23rd April, 1955.

U.S.A. ST. ELIZABETH HOSPITAL, Elizabeth, N.J., U.S.A. (250 Beds.) Applications are invited to fill vacancies for 2 INTERNS to serve for 1 year. Hospital approved by A.M.A. Intern training being conducted. Salary $100 plus maintenance.

Apply Administrator.

U.S.A. BRIDGEPORT HOSPITAL, Bridgeport, Con-NECTICUT. Approved ROTATING INTERNSHIPS available in a general hospital of 387 Beds and 60 bassinets ; approved residencies in medicine, surgery, obstetrics, pathology, radiology, and anesthesiology. Stipend of $190 per month in addition to full maintenance and uniforms. Exchange-visitor programme participant (P–619).

Address inquiries to Chairman, Committee on Medical Education of Interns and Residents, Bridgeport Hospital, Bridgeport, 10, Connecticut, U.S.A.

Public Appointments

GOVERNMENT OF THE UNION OF SOUTH AFRICA. DEPARTMENT OF PUBLIC HEALTH.

(1) Applications are invited from suitably qualified persons, on contract for 3 years, renewable for a further period, to the Public Service of the Union of South Africa for the following posts :—

(2) Designation : MEDICAL OFFICER. Salary scale £1020–£60–£1380 p.a. In addition to the above married persons will be paid a cost-of-living allowance of £234 p.a.

(3) Minimum qualifications : Applicants must have qualifications registrable with the South African Medical and Dental Council.

(4) Duties of successful applicants : Medical Officers will be required to serve in Mental, Tuberculosis, Leprosy hospitals and in Health Centres.

(5) Conditions of employment will in the first place be governed by the terms of the contract and the Public Service Regulations. Successful applicants will be required to acquire within a reasonable time a knowledge of the Afrikaans language.

(6) Transport expenses from place of residence to place of employment (third-class rail in United Kingdom, tourist, cabin or cheapest first-class boat to South Africa, whichever is available, and first-class rail in South Africa, including excess baggage to a maximum of 150 lbs. per adult and 75 lbs. per child, and similar return passage on satisfactory completion of contract, will be paid by the Union Government.

(7) Applications in writing, giving full details of qualifications and previous experience, should be addressed to Room 102, South Africa House, Trafalgar-square, London, W.C.2, not later than 23rd April, 1955.

DERBYSHIRE COUNTY COUNCIL. County Health DEPARTMENT. ASSISTANT MATERNITY AND CHILD WELFARE MEDICAL OFFICERS AND SCHOOL MEDICAL OFFICERS. Applications are invited from registered medical practitioners for whole-time superannuable posts. Salary £950–£50–£1300 p.a. Car allowance.

Particulars and application forms obtainable from Dr. J. B. S. MORGAN, County Medical Officer, St. Mary's-gate, Derby, to whom they should be returned by 13th April, 1955.

MANCHESTER. CITY OF MANCHESTER EDUCATION COMMITTEE. Applications are invited for the post of ASSISTANT MEDICAL OFFICER (school health). Preference will be given to candidates who have had special experience in diseases of children and retinoscopy, and hold D.P.H. or D.C.H. Salary £950–£1300. Previous experience in a similar appointment with another local authority may be taken into account in determining initial salary.

Application form and particulars obtainable (stamped addressed foolscap envelope) from the Acting Chief Education Officer, P.O. Box 480, Education Offices, Deansgate, Manchester, 3. To be returned by 14th April, 1955.

ROTHERHAM. COUNTY BOROUGH OF ROTHERHAM. Applications are invited from registered medical practitioners (Male) for the post of DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER at a salary within the consolidated range of £1166 13s. 4d. rising by 5 annual increments of £50 to £1416 13s. 4d. The commencing salary will be determined at a point within the scale, having regard to the experience of the successful candidate. Applicants must possess a D.P.H. and have had previous experience in school health, maternity and child welfare, and general public health work. The person appointed will be responsible, under the direction of the Medical Officer of Health, for carrying out administrative and other duties in all sections of the work of the Health Department, and must be capable of assuming full responsibility for the Department when necessary. The appointment is whole-time, and the successful candidate will not be allowed to engage in private practice. The appointment will be terminable at any time by 3 months notice in writing on either side and will be subject to the Medical Whitley Council's General Conditions of Service for Public Health Medical Officers. The appointment is also subject to the approval of the successful candidate by the Minister of Education under the Handicapped Pupils and School Health Service Regulations 1945. The successful candidate will be required to pass a medical examination for superannuation purposes. The tenancy of a 3-bedroomed house is available, if required.

Forms of application may be obtained from the Medical Officer of Health, Municipal Offices, Rotherham, and must be returned to the undersigned, giving the names of 3 referees, and endorsed "Deputy Medical Officer of Health," by 16th April, 1955. Every application must state whether the candidate is related to any member or officer of the Rotherham County Borough Council and deliberate omission to disclose any such relationship will disqualify the candidate. Canvassing of members of the Council whether direct or indirect will disqualify any candidate. JOHN S. WALL, Town Clerk.

Municipal Offices, Rotherham.

TREASURY MEDICAL SERVICE. Applications are invited from medical practitioners, practising in the districts detailed below, for appointment, in a part-time and mainly advisory capacity, as LOCAL TREASURY MEDICAL OFFICER for each of the places or groups of places shown. The town shown in brackets after the place-names indicates the Head Post Office Area in which the place, or group of places, is situated. Successful applicants will be required to examine and report on the condition of certain Government Officers, teachers, candidates for appointment, &c., who may be referred to them from time to time; and to attend when summoned to an emergency case of accident or sudden illness occurring in a Government office in the neighbourhood. Fees for this work, and mileage allowance where necessary, will be paid on a scale agreed with the British Medical Association.

Intending applicants should write, within 14 days, to Treasury Medical Adviser, Treasury Chambers, Whitehall, S.W.1, for a form on which application may be made. Applicants should be not more than 60 years of age.

The places for which applications are invited are as follows :—

ENGLAND AND WALES

East Grinstead (East Grinstead).
Gainsborough (Gainsborough).
Leicester, N. and W. (Leicester).
Llandrindod Wells, Dolau and Llanbister (Llandrindod Wells).
Thirsk (Thirsk).
Walthamstow (London, E.17).

SCOTLAND

Achnashellach and Lochcarron (Kyle).
Duns (Duns).

NEW SOUTH WALES DEPARTMENT OF PUBLIC HEALTH. DIRECTOR, Division of Industrial Hygiene. Salary £A2650 p.a. Applications are invited from legally qualified medical practitioners possessing special knowledge and experience in the field of Industrial Hygiene and Industrial Medicine. Duties: Supervision of the Division of Industrial Hygiene, surveys of health conditions in industry, medical examination of persons engaged in industry and ancillary duties. Appointees will be eligible, subject to medical fitness, to contribute to the State Superannuation Fund. First-class shipping fares of appointee and family to Sydney will be paid.

Applications (4 copies), setting out name, age, qualifications, with other relevant particulars, and 4 copies of any supporting documents, should be lodged at the Office of the Agent General for New South Wales, 56, Strand, London, W.C.2 (from whom further particulars can be obtained), by 9th May, 1955.

LANCASHIRE COUNTY COUNCIL. Divisional Medical OFFICER required for Health Division 15, Eccles. Applicants must be medical practitioners holding D.P.H. or equivalent qualification and with administrative experience. Will be required to act as Medical Officer of Health to County Districts within the Division where they so desire. Basic salary £1300–£50–£1700, with substantial increase if appointed Medical Officer of Health to 1 or more County Districts. Appointment superannuable and subject to passing medical examination.

Full particulars and application forms from County Medical Officer (Serial No. 49), East Cliff County Offices, Preston, returnable by 26th April, 1955.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

MOORENDS, near DONCASTER. Applications are invited for a general medical practice VACANCY in rural mining area. List at present approximately 2800. Modern dwelling house and separate surgery accommodation available for purchase. Apply on Form E.C.16A to the undersigned, from whom further particulars and forms may be obtained. Closing date for applications 18th April, 1955.

C. H. STABLER, Clerk,
Yorkshire West Riding Executive Council.
5, St. John's-north, Wakefield, Yorks.

Hospital Services : Non-Medical Appointments

HERTFORD COUNTY HOSPITAL, Hertford, Hertfordshire. (173 Beds. 20 miles from London.) Applications are invited for the post of MEDICAL LABORATORY TECHNICIAN who must be qualified and well experienced in pathological histology. Whitley Council salary and conditions of service.

Apply, giving details of age, qualifications, experience, and names of 2 referees, to the Hospital Secretary.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies.

Plastic Surgeon wanted, well qualified and trained, who would be interested in immigrating to the United States and taking out citizenship papers. To be associated with a large mid-western plastic surgery Clinic. Guaranteed minimum of $10,000 per year net. For right person, $25,000 net income with 2–3 years is assured. Must spend 6 months in Rotating Internship to fulfil requirements for State Laws. Private practice devoted entirely to plastic surgery—growing rapidly. Senior partner retiring. Write all particulars, including references and type and extent of general surgical training and when you would be available.—Address, No. 105, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

American Pathologist, certified by the American Board of Pathology, serving 250-Bed general hospital and County laboratory, is interested in exchanging positions for a 6-month period with a British Pathologist having similar situation.—Address, No. 118, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Parke, Davis & Company Limited, require a medical man not over 40 with some literary ability for their Medical Service Department. Duties will include medical correspondence, compilation and editing of literature, and in due course some lecturing. The post is progressive and pensionable. The commencing salary will be not less than £1000 p.a., depending on knowledge and ability.—Apply in first instance for application form to Personnel Manager, Parke, Davis & Company Limited, Staines-road, Hounslow, Middlesex.

Consulting-rooms, full and part time, and Houses in the medical area.—ELGOOD & Co., 1, Bentinck-street, W.1 (WELbeck 8974).

Present Tenant of rooms in Medical Area, West End, 2 Licences available, wishes to contact anyone interested in sharing. Very reasonable rent. Radiographic and Electrocardiographic Services available.—Address, No. 119, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Austin. The New Show Models A.30, A.40, A.50 and A.90. Limited number of deliveries to proven essential users.—Application form, brochures, easy terms from Austin House, 140–144, Golders Green-road, Golders Green, London, N.W.11.

Typewriting and Duplicating. First-class work at moder- ate prices by experienced medical typists.—SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM. 5329/0504).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Family Planning Association.

Sub-fertility Centre. Investigation and advice on treatment of sub-fertility problems. Patients accepted only through doctors, hospitals and clinics.

Pregnancy Diagnosis. Specimens of urine accepted for testing (Hogben Test) from doctors, hospitals and clinics anywhere. Results available within 24 hours of receipt of specimen.

Telephone or write for details: Family Planning Association, 64, Sloane-street, London, S.W.1 (SLOane 9112).

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

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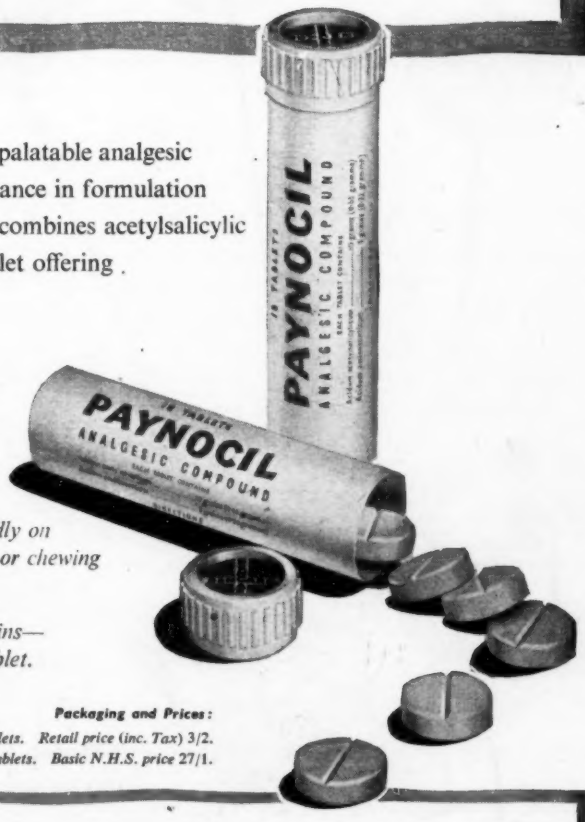

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It is equally suitable for the occasional analgesia required for headaches or neuralgia owing to its convenience and acceptability to all patients.

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